# *2004*
# *HAZARD MITIGATION PLAN*
# *for*
# *KNOX COUNTY, MAINE*

December 27, 2004

Knox County Emergency Management Agency
62 Union Street, Rockland, ME 04841

# KNOX COUNTY HAZARD MITIGATION PLAN

## TABLE OF CONTENTS

# KNOX COUNTY HAZARD MITIGATION PLAN

## I. INTRODUCTION

Understanding that the Local Mitigation Plan requirements in §201.6 of the Interim Final Rule applies to local jurisdictions, the County of Knox, State of Maine decided to complete a multi-jurisdictional mitigation plan to include and incorporate each of its member towns. This is due to the fact that the majority of these communities are too small to complete such an undertaking on their own. This county-wide mitigation planning effort encouraged agencies at all levels, local residents, businesses, and the non-profit sector to participate in the mitigation planning and implementation process. This broader public participation enabled the development of mitigation measures that are supported by these various stakeholders and reflects the need of the county-wide community.

Although the Rule interim criteria (for local plans) recommends that communities should include man-made and technological hazards along with addressing natural hazards, the Knox County Hazard Mitigation Planning Team decided to review only natural hazards at this time. The Team agrees with FEMA that in many instances, natural disasters have secondary effects, such as dams breaking due to floods, or hazardous material releases due to tornadoes, however, we decided to complete only the natural disasters in our first attempt at a Mitigation Plan. We hope to complete a true Multi-hazard plan, which will better prepare our communities in the event of such disasters, in a later version.

The Knox County Hazard Mitigation Plan includes the following sections:

- Prerequisites
- Planning Process
- Risk Assessment
- Mitigation Strategy
- Plan Maintenance Procedures

Knox County in the State of Maine, combines the scenic beauty of the rugged Maine coast with the lush forests and farmlands of the inland hills, yielding harvests both cultivated and wild.

Knox County consists of 39,618 residents living in 16,608 households and contains 1142 square miles of which 365 square miles (32%) is land. This derives a population density of 108.3 people per square mile. There are no U.S. Census designated Metropolitan areas in Knox County.

There are seventeen incorporated towns and one incorporated city, the "shiretown" or county seat of Rockland. The County government contains the County Sheriff's Department and County Jail, County Clerk's Office, County Treasurer's Office, Registrar of Deeds, Probate Judge, Assistant District Attorney, and the Emergency Management Office. The municipalities are responsible for Tax Collection, Clerk's Office, Road Maintenance and Snow Removal, Refuse Collection, Land Use Planning, Code Enforcement, Animal Control, Fire Protection, and Cemetery Maintenance

The three largest employers in the County are MBNA New England, Penobscot Bay Medical Center, and the State of Maine.

**MUNICIPAL POPULATIONS (2000)**

| Town/City | Year Round Population | Seasonal Population | Density (sq mi) | Total Homes | Year Rd Homes | House hold Density |
|---|---|---|---|---|---|---|
| Appleton | 1,271 | 168 | 38.8 | 547 | 480 | 2.65 |
| Camden | 5,254 | 1,232 | 287.3 | 2,883 | 2,390 | 2.20 |
| Cushing | 1,322 | 592 | 68.1 | 778 | 541 | 2.44 |
| Friendship | 1,204 | 853 | 85.9 | 849 | 508 | 2.37 |
| Hope | 1,310 | 453 | 60.0 | 687 | 513 | 2.55 |
| Isle Au Haut | 79 | 330 | 6.2 | 164 | 32 | 2.47 |
| Matinicus Isle Pl | 51 | 200 | 31.8 | 135 | 26 | 1.96 |
| North Haven | 381 | 815 | 32.7 | 488 | 162 | 2.35 |
| Owl's Head | 1,601 | 673 | 180.1 | 992 | 723 | 2.21 |
| Rockland | 7,609 | 795 | 589.2 | 3,752 | 3,434 | 2.22 |
| Rockport | 3,209 | 760 | 147.8 | 1,677 | 1,373 | 2.34 |
| St. George | 2,580 | 1,645 | 100.9 | 1,777 | 1,119 | 2.31 |
| South Thomaston | 1,416 | 525 | 129.4 | 804 | 594 | 2.38 |
| Thomaston | 3,748 | 248 | 343.2 | 1,535 | 1,436 | 2.61 |
| Union | 2,209 | 473 | 68.8 | 1,052 | 863 | 2.56 |
| Vinalhaven | 1,235 | 1,695 | 48.8 | 1,228 | 550 | 2.25 |
| Warren | 3,794 | 470 | 81.8 | 1,534 | 1,346 | 2.82 |
| Washington | 1,345 | 440 | 35.4 | 694 | 518 | 2.60 |
| TOTAL | 39,618 | 12,367 | 108.5 | 21,576 | 16,608 | 2.39 |

**COUNTY DEMOGRAPHIC PROFILE - Knox County, State of Maine**

| Measure | 2000 Knox | 1990 Knox | 2000 Maine | 2000 USA |
|---|---|---|---|---|
| **Population** | | | | |
| Total Population | 39,618 | 36,310 | 1,274,923 | 281,421,906 |
| % White | 98.3 | 99.2 | 96.9 | 62.6 |
| % Black | 0.2 | 0 | 0.5 | 12.3 |
| % American Indian | 0.2 | 0 | 0.6 | 0.9 |
| % Asian | 0.4 | 0 | 0.7 | 3.6 |
| % Hispanic Origin | 0.6 | 0 | 0.7 | 12.5 |
| **Households** | | | | |
| Total Households | 16,608 | 14,344 | 518,200 | 105,480,101 |
| Household Units | 21,612 | 19,009 | 651,901 | 115,904,641 |
| Avg. Household Size | 2.31 | 2.45 | 2.39 | 2.6 |
| **Income** | | | | |
| Median Household Income ($) | 36,774 | 25,405 | 37,240 | 41,994 |
| Persons below poverty, % 1997 | 10.1 | 11.9 | 10.9 | 12.4 |
| Children below poverty, % 1997 | 11.9 | 15.2 | 13.0 | 16.1 |
| **Sex and Age** | | | | |
| Median Age, Total Population | 41.4 | | 38.6 | 35.3 |
| % Female | 51.2 | 51.5 | 51.3 | 50.9 |
| % Male | 48.8 | 48.5 | 48.7 | 49.1 |
| % Under 5 Years | 5.3 | 6.7 | 5.5 | 6.8 |
| % 18 Years and over | 77.6 | 75.6 | 76.4 | 74.3 |
| % 65 Years and over | 17.2 | 17.0 | 14.4 | 12.4 |
| Population Density (sq. mi.) | 108.3 | 99.3 | 41.3 | 79.6 |

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## II. PREREQUISITES
## ADOPTION BY THE LOCAL GOVERNING BODY

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RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lesson the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, the 16 towns, 1 plantation and 1 city of Knox County are committed to the mitigation goals and measures as presented in this plan;

Therefore the Knox County Commissioners, Rockland City Council and the Boards of Selectmen of the 18 Incorporated Municipalities hereby adopt the 2004 Knox County Hazard Mitigation Plan.

AUTHORIZING SIGNATURES

Commissioner, Knox County — Date: 9-18-04

Commissioner, Knox County — Date: 9/14/04

Commissioner, Knox County — Date: 9/14/04

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Selectman, Appleton — 28 Sep 2004 Date — Selectman, Appleton — 9/28/04 Date

Selectman, Appleton — 28 Sept. 04 Date

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AUTHORIZING SIGNATURES

Selectman, Camden — 12604 Date

Selectman, Camden — 12.9.04 Date

Selectman, Camden — 12/09/04 Date

Selectman, Camden — 12/9/04 Date

Selectman, Camden — 12/6/04 Date

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AUTHORIZING SIGNATURES

Selectman, Cushing — 9-13-04 Date

Selectman, Cushing — 9/13/04 Date

Selectman, Cushing — 9-12-04 Date

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AUTHORIZING SIGNATURES

Arthur Thompson 9-27-04
Selectman, Friendship — Date

_____ _____
Selectman, Friendship — Date

Carl B Mueller 9-27-04
Selectman, Friendship — Date

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AUTHORIZING SIGNATURES

| | | | |
|---|---|---|---|
| Selectman, Hope | 10/26/04 Date | Selectman, Hope | 10-26-04 Date |
| Selectman, Hope | 10-26-04 Date | Selectman, Hope | 10/26/04 Date |
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AUTHORIZING SIGNATURES

Selectman, Isle Au Haut — 11-29-04 Date

Peter Burke
Selectman, Isle Au Haut — 11/29/04 Date

Selectman, Isle Au Haut — 11-29-04 Date

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AUTHORIZING SIGNATURES

| | | | |
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| Assessor, Matinicus Isle Pl | 12-15-04 Date | Assessor, Matinicus Isle Pl | 12-15-04 Date |
| Assessor, Matinicus Isle Pl | Date | | |

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AUTHORIZING SIGNATURES

Patricia Curtis — Selectman, North Haven — 9-21-04 Date

Linda Darling — Selectman, North Haven — 9/21/04 Date

Selectman, North Haven — 9-21-04 Date

Karen Cooper — Selectman, North Haven — 9/21/04 Date

Selectman, North Haven — 9/21/04 Date

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AUTHORIZING SIGNATURES

Nancy Nelson 9-21-04
Selectman, Owls Head Date

Thomas E. Hills 9-21-04
Selectman, Owls Head Date

Deena Carafelli 9-21-04
Selectman, Owls Head Date

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AUTHORIZING SIGNATURES

Edward J. Mazurek — Mayor, Rockland — 11/8/04 — Date

Councilman, Rockland — 11/8/04 — Date

Patricia McWatters — Councilman, Rockland — 11/8/04 — Date

Mark Curtis — Councilman, Rockland — 11/8/04 — Date

Brian R Harden — Councilman, Rockland — 11/8/04 — Date

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AUTHORIZING SIGNATURES

Selectman, Rockport — 10/12/04 Date

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AUTHORIZING SIGNATURES

Selectman, St. George — 9/20/2004 Date

Selectman, St. George — 9/20/04 Date

Selectman, St. George — 20 SEP 04 Date

Selectman, St. George — 9/20/04 Date

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AUTHORIZING SIGNATURES

Selectman, South Thomaston — 10/5/04 Date

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AUTHORIZING SIGNATURES

Selectman, Thomaston — Date: Sept 27, 2004

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Selectman, Thomaston — Date: 9/27/04

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AUTHORIZING SIGNATURES

Selectman, Union — 10/05/04 Date

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AUTHORIZING SIGNATURES

Jason A Day — Selectman, Vinalhaven — 9/27/04 — Date

Bodine M. Ames — Selectman, Vinalhaven — 9/27/04 — Date

Kathi Young — Selectman, Vinalhaven — 9/27/04 — Date

_____ — Selectman, Vinalhaven — _____ — Date

Carlene W. Michael — Selectman, Vinalhaven — 9/27/04 — Date

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Whereas, natural and man-made disasters may occur at any time, we recognize that to lesson the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, the 16 towns, 1 plantation and 1 city of Knox County are committed to the mitigation goals and measures as presented in this plan;

Therefore the Knox County Commissioners, Rockland City Council and the Boards of Selectmen of the 18 Incorporated Municipalities hereby adopt the 2004 Knox County Hazard Mitigation Plan.

AUTHORIZING SIGNATURES

| | | | |
|---|---|---|---|
| Selectman, Warren | 12/8/04 Date | Selectman, Warren | 12/8/04 Date |
| Selectman, Warren | 12/8/04 Date | Selectman, Warren | 12/8/04 Date |
| Selectman, Warren | 12/8/04 Date | | |

# KNOX COUNTY HAZARD MITIGATION PLAN

## II. PREREQUISITES
## ADOPTION BY THE LOCAL GOVERNING BODY

| | |
|---|---|
| **Requirement §201.6(c)(5):** | **The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., Municipal Board of Selectmen, the City Council, and County Commissioners)** |
| **Requirement §201.6(c)(5):** | **For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.** |

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lesson the impacts of these disasters we will save resources, property and lives in Knox County;

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And whereas, the 16 towns, 1 plantation and 1 city of Knox County are committed to the mitigation goals and measures as presented in this plan;

Therefore the Knox County Commissioners, Rockland City Council and the Boards of Selectmen of the 18 Incorporated Municipalities hereby adopt the 2004 Knox County Hazard Mitigation Plan.

AUTHORIZING SIGNATURES

Selectman, Washington — 10/13/04 Date

Selectman, Washington — 10/13/04 Date

Selectman, Washington — 10/13/2004 Date

## MULTI-JURISDICTIONAL PLANNING PARTICIPATION

| | |
|---|---|
| **Requirement §201.6(a)(3)** | **Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process… Statewide plans will not be accepted as multi-jurisdictional plans.** |

The Knox County Hazard Mitigation Plan is a multi-jurisdictional plan and has been prepared by a Hazard Mitigation Planning Team hosted by the Knox County Emergency Management Agency with representatives from the state, county and municipal governments, private and volunteer sectors. The Planning Team also met or spoke with representatives of each of the 18 municipalities to collect their comments and recommendations on the identification of hazards, assessment of vulnerabilities and risks, and the determination of mitigation goals and measures.

**The Hazard Mitigation Planning Team consisted of the following representatives:**

| | | |
|---|---|---|
| Anne-Beebe Center | County Commissioner, Knox County | 594-2060 |
| Sylvia Birmingham | Director, Knox County EMA | 594-5155 |
| Donna Allen | Clerk, Knox County EMA | 594-5155 |
| Dale D. Rowley, P.E. | Planner/Engineer, Thorndike Engineering | 568-4040 |
| Taylor Vaughan | EMA Director, Town of Appleton | 785-5511 |
| Athur T. Kiskila | EMA Director/Fire Chief, Town of Cushing | 754-2339 |
| Kyle Martin | EMA/Public Works Director, Town of Friendship | 832-6059 |
| Clarence Keller | EMA Director/Fire Chief, Town of Hope | 763-4118 |
| Craig Cooley | EMA Director, Town of Rockport | 236-2026 |
| Timothy Polky | EMA Director/Fire Chief, Town of St. George | 372-6363 |
| Bill Brown | EMA Director, Town of South Thomaston | 596-6020 |
| Phillip Netzorg | EMA Director, Town of Thomaston | 354-0938 |
| Paul Doughty | EMA Director/Fire Chief, Town of Union | 785-2191 |
| Marjorie Stratton | EMA Director/Town Manager, Town of Vinalhaven | 863-4471 |
| George Field | EMA Director, Town of Warren | 273-2772 |
| Tom Johnston | EMA Director/Fire Chief, Town of Washington | 845-2816 |

Not every municipality in Knox County had a member on the Hazard Mitigation Planning Team. However, each municipality participated in one of several ways. Much of the information for this plan was collected from Data Surveys that were sent out to each municipality. Most of the towns filled out the information which consisted of Planning and Development Information, Critical Infrastructure Inventory, Real Property Assessments, Road Information, and a listing of Reoccurring disaster damage areas. Those towns that did not send in their Surveys were interviewed individually at their Town Offices. Finally, every community participated in the Mitigation Measure Selection Process by attending several public meetings held at the County EMA office after the Hazard Mitigation Planning Team completed their work. The following individuals represented their respective municipalities.

**The Municipal Hazard Mitigation Planning Representatives consisted of the following:**

| Name | Municipal Position | Municipality |
|---|---|---|
| Taylor Vaughan | EMA Director | Appleton |
| Steve Gibbons | EMA Director/Fire Chief | Camden |
| Athur T. Kiskila | EMA Director/Fire Chief | Cushing |
| Kyle Martin | EMA Director/Public Works Director | Friendship |
| Clarence Keller | EMA Director | Hope |
| Keith Aisner | EMA Director | Isle Au Haut |
| Eva Murray | EMA Director | Martinicus Isle Pl |
| Dake Collins | EMA Director/Town Administrator | North Haven |
| Alton Hadley III | EMA Director/Town Administrator | North Haven |
| Frank Ross III | EMA Director/Fire Chief | Owl's Head |
| Raymond Wooster | EMA Director/Fire Chief | Rockland |
| Craig Cooley | EMA Director | Rockport |
| Timothy Polky | EMA Director/Fire Chief | St. George |
| Bill Brown | EMA Director | South Thomaston |
| Phillip Netzorg | EMA Director | Thomaston |
| Paul Doughty | EMA Director/Fire Chief | Union |
| Marjorie Stratton | EMA Director/Town Manager | Vinalhaven |
| George Field | EMA Director | Warren |
| Tom Johnston | EMA Director/Fire Chief | Washington |

**The Following Organizations and Agencies participated in the development and review of the Knox County Hazard Mitigation Plan:**

Knox County Commissioners
Knox County Emergency Management Agency
Knox County Regional Communication Center

## III. PLANNING PROCESS

In compliance with §201.4(b) and §201.4(c)(1) Knox County held all its planning meetings as open forums. Press releases and status reports were utilized to advertise and explain the mitigation planning process to the public. The Team included opportunities for the public and our neighboring counties to comment on the plan at all stages of its formation. The Planning Team reviewed the existing county and municipal emergency plans and incorporated information as appropriate. The following describes our documentation of the planning process, including how the plan was prepared, who was involved in the process and how the public was involved.

### DOCUMENTATION OF THE PLANNING PROCESS

| | |
|---|---|
| **IFR Requirement §201.6(c)(1):** | **[The plan must document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.** |

Knox County has developed a local comprehensive Hazard Mitigation Plan. The Knox County Emergency Management Agency was assigned the responsibility for hosting the development of the mitigation plan by the Knox County Commissioners. The County EMA formed a mitigation planning team comprised of representatives from county government and local municipal governments (see page 9 for a list of the Team members). This Team met on 11 occasions over the course of 16 months.

An effort was made to solicit public input during the planning process. A general public meeting was held at the beginning of the formulation of the Planning Team in the County EMA offices. A public meeting was held at the County EMA office after a completed draft of the plan was provided. These meetings were advertised by sending out letters to the municipalities and by posting meeting notices on bulletin boards in municipal offices.

A press release was published in the Courier Gazette, the local weekly county-wide newspaper to advertise and explain the mitigation planning process to the county residents. The press release included the phone number, postal address and e-mail address of the County EMA office, so that those who could not attend public forums would have a chance to voice concerns or provide input during the planning process.

Notices were e-mailed periodically to the municipal offices in order to keep the towns up to date on the progress of the Hazard Mitigation Plan. These notices did initiate several municipal officers to contact the County EMA office with questions and comments regarding the mitigation plan and their involvement in the plan.

The Hazard Mitigation Planning Team was assisted in the development of the plan by hiring an engineering and planning consultant to facilitate the meetings, assist in research and outreach programs, to coordinate the GIS mapping, complete the loss estimates and to consolidate the information and comments provided by the planning team and the public.

We must admit that there was very little participation from the general public, non-profits and local businesses, who expressed that they had no interest in the project. We did have a lot of participation from a nearby college (Unity College), which provided the GIS mapping work.

# KNOX COUNTY HAZARD MITIGATION PLAN

The final version of the Knox County Hazard Mitigation Plan was presented in public forum at each municipality to seek adoption of the plan on behalf of each of the 18 communities.

**PRESS RELEASE**

(Rockland, Maine) -- The Knox County Emergency Management Agency (EMA) has initiated an effort to complete a Comprehensive Hazard Mitigation Plan using the guidelines as provided by the Federal Emergency Management Agency or FEMA.

The purpose of a Hazard Mitigation Plan is to assess the County's risk to likely disasters, inventory critical infrastructure and special need populations, and develop goals and strategies to lessen the impacts of a potential disaster. Examples of disaster mitigation include floodplain management, whereby new construction in floodplains is limited, and the cutting back of tree limbs from electric power lines to prevent the trees from damaging the lines in a storm.

"One of the most important aspects of the Hazard Mitigation Planning process is the involvement of the public in the development of the County Plan," stressed Sylvia Birmingham, Director of the Knox County EMA program. "Inputs from all municipalities and all interested citizens are vital in order to make this plan work."

County residents, businesses, non-profit groups, and municipalities with knowledge of past disaster events, repetitive areas of repair after storms and floods, and locations of critical facilities and utilities and special needs populations that could be impacted by a disaster are strongly encouraged to provide that information to the Hazard Mitigation Planning Committee hosted by the Knox County EMA office.

For more information, contact Sylvia Birmingham at 594-5155.

## IV. RISK ASSESSMENT

§201.6(c)(2) of the Rule outlines specific information that Knox County must consider when completing the risk assessment portion of this mitigation plan. Our local risk assessments provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. This plan includes detailed descriptions of all the potential hazards that could affect the jurisdiction along with an analysis of the jurisdiction's vulnerability to those identified hazards. Specific information about numbers and types of structures, potential dollar losses, and an overall description of land use trends in the jurisdiction are included in this analysis. Because this is a multi-jurisdictional plan, the risks that affect only certain regions of the County were assessed separately in the context of the affected region.

This section includes the following six subsections as follows:

- Identify Hazards
- Profiling Hazard Events
- Assessing Vulnerability: Identifying Assets
- Assessing Vulnerability: Estimating Potential Losses
- Assessing Vulnerability: Analyzing Development Trends
- Multi-jurisdictional Risk Assessment

# KNOX COUNTY HAZARD MITIGATION PLAN

## IDENTIFYING HAZARDS

| ***Requirement §201.6(c)(2)*(i):** | **The risk assessment shall include a description of the type … of all natural hazards that can affect the jurisdiction…** |
|---|---|

The Knox County Hazard Mitigation Planning Team identified several natural hazards that are addressed in the County Hazard Mitigation Plan. These hazards were identified through an extensive process that utilized input from the Hazard Mitigation Planning Team members (comprised of representatives from state, county and municipal governments), public input, researching past disaster declarations in the County, a review of current maps, and a risk assessment completed by the Knox County Emergency Management Agency and the Hazard Mitigation Planning Team. The Risk Assessment is shown on page 17 and is labeled as Worksheet #1.

The following table identifies the natural hazards to be profiled.

| Hazard | How identified | Why identified |
|---|---|---|
| Flooding | Review of FIRM Maps<br>Review of SLOSH Maps<br>Input from residents<br>Review of past disaster declarations<br>Identification of repetitive losses<br>Risk Assessment on page 17 | Associated with the effects of spring runoff and coastal storms.<br>Several repetitive loss properties and roadways are located in the County.<br>The County contains one major river and many streams and lakes, and is located along the coast.<br>Several coastal communities experience coastal flooding during major storm events - winter and summer. |
| Severe Storm Events (Winter & Summer) | Review of past disaster declarations<br>Inputs from residents<br>Risk assessment on page 17 | Maine is frequently hit with blizzards and “Northeaster” storms and summer coastal storms.<br>The Maine coastal communities are often subject to ice storms. |
| Wildfire | Review of Maine Forest Service records<br>Inputs from residents<br>Risk assessment on page 17 | Much of the County is covered with forests. Wildfires have been numerous, though small, in the past. |

The following table identifies the hazards that were eliminated from further consideration in the plan, due to a lack of historical evidence, lack of overall county-wide severity or a low likelihood for the event to occur. However, although these disaster events were not profiled in the hazard mitigation plan, it does not certify that any of these events will not or could not occur and cause great damage. It was decided by the Knox County Hazard Mitigation Planning Team to keep our first plan simple by only profiling the top three hazards.

| | | |
|---|---|---|
| Avalanche | Review of USGS Maps | There are no mountains in the county that hold large amounts of snow which would create avalanches. |
| Blight/ Infestation | Review of State Entomological Office historical records<br>Inputs from residents<br>Risk Assessments | Though the County is heavily dependent on its agricultural production, to include forestry, farming and fishing, there are no historical records of major damage to these products that have caused serious economic conditions. |
| Coastal Erosion | Input from State Planning Office<br>Input from NRCS<br>Input from Maine DEP<br>Input from residents | The County is undergoing development pressure along the coast.<br>Coastline stabilization measures have been implemented in the past year. |
| Drought | Review of State EMA records<br>Review of NOAA records | Rainfall data doesn't show a serious problem. The drought effects have never been sufficient enough to create disaster conditions. |
| Earthquake | Review of Maine Geological Survey records | Although Earthquakes are common in Maine, no significant damaging movement has occurred in 20,000 years. |
| Hurricanes | Review of past disaster declarations<br>Review of library historical data<br>Input from residents<br>Risk assessments | The County is hit about every decade by a hurricane, however, the hurricanes are not very powerful by the time they hit Knox and they do not cause any real damage to personal and property. Flooding from this event will be discussed under the Flooding Hazard. |
| Landslide | Review of Maine Geological Survey records | Landslides are not common in Knox County, though there was one in Rockland a few years ago. |
| Subsidence | Review of Maine Geological Survey records | There have been no known cases of subsidence in Knox County. |
| Tornado & Severe Wind Storms | Review of NWS records | On average, 1-2 tornadoes occur in the State of Maine each year, yet there have been no loss of life or major damages in many years. Neither have there been any recorded damages from microbursts or wind storms in Knox County. |

# KNOX COUNTY HAZARD MITIGATION PLAN

## HISTORICAL CHART OF HAZARD EVENTS IN KNOX COUNTY

The following chart is a compilation of the Knox County Hazard Mitigation Team's research efforts to determine what disaster events have occurred in Knox County in the last century. We found few disasters during the first half of the 20th Century. This is due in part from the poor records that were kept; the fact that there was very little development in the County before 1950; and the fact that the residents mostly lived in homes built in the 19th Century which were built to withstand winter storms and were built out of known flood areas. After 1950, people started moving in from outside the State and these people began to build in flood-prone areas and in less hardy structures. Additionally, there was very little threat from wildfires before the 1950s, because most of the land had been cleared for farmland. After 1950, the farms fell to ruin and the fields have since grown up into forests.

| YEAR | MONTH | DAY | STATEWIDE ESTIMATED DAMAGE | TYPE OF DAMAGE | DECLARATION |
|---|---|---|---|---|---|
| 1954 | August | 31 | $5,000,000 | Hurricane Carol | SBA |
| 1954 | September | 11 | $7,000,000 | Hurricane Edna | Disaster |
| 1960 | September | 5 | | Forest Fire | |
| 1963 | October | 29 | | Hurricane Ginny | |
| 1972 | February | 19 | | Winter Storm | State Aid |
| 1975 | May | 8 | $300,000 | Flooding | SBA |
| 1978 | February | 8 | $20,693,181 | Flooding | Disaster |
| 1978 | January | 10 | | Winter Storm | |
| 1979 | September | 6 | | Hurricane David | |
| 1980 | October | 25 | $715,350 | Coastal Storm | SBA |
| 1985 | | | | Hurricane Gloria | |
| 1987 | April | | | Flooding | |
| 1990 | December | 3 | | Flooding | |
| 1990 | December | 4 | | Severe Winter Storm | |
| 1991 | August | | | Hurricane Bob | |
| 1991 | October | 30 | | Coastal Storm | |
| 1991 | October | 31 | | Coastal Storm | |
| 1992 | March | 11 | | Flooding | Disaster |
| 1993 | April | | | Flooding | |
| 1993 | January | | | Severe Winter Storm | |
| 1993 | March | 29 | | Flooding | |
| 1993 | March | 15 | | Winter Storm | Emergency |
| 1993 | May | 11 | | Flooding | Disaster |
| 1995 | December | | | Severe Winter Storm | |
| 1995 | November | 15 | | Flooding | |
| 1996 | March | 13 | | Severe Storm/Flooding | |
| 1996 | October | 21 | | Severe Storm/Flooding | Disaster |
| 1998 | January | 13 | | Ice Storm | Disaster |

The worksheet on the following page was used by the Knox County Hazard Mitigation Planning to review the known disaster events and to analyze the severity and likelihood of these events. The analysis allowed the team to prioritize the events. The team decided to concentrate on the top three prioritized hazards for profiling.

# KNOX COUNTY HAZARD MITIGATION PLAN

**Worksheet #1 Identify the Hazards step 1**

Date: February 26, 2003

Natural Disasters

| Type of Hazard | Hazard Events (Dates/Casualties/Damages) | Source of Information | Rating | Priority |
|---|---|---|---|---|
| Coastal Erosion | Erosion to coast has caused damage to homes and roads. | Maine Coastal Program | 2B | 4 |
| Flooding | Roadways in Flood areas | FIRM Maps | 2B | 2 |
| Severe Summer & Winter Storms | Ice Storm 98 | NWS | 3A | 1 |
| Landslide | Damages to roads in Rockland | County EMA records | 1C | 5 |
| Wildfire | October 1947 Fire | Maine Forest Service | 2B | 3 |

Rating:
Severe (Multiple deaths, Mass casualties, or Millions of dollars in damages) = 3
High (Deaths or Injuries, or 100,000s of dollars in damages) = 2.5
Moderate (Single death or several injuries, or 10,000s of dollars in damages) = 2
Low (Injuries or a 1,000s of dollars in damages) = 1.5
Slight (No deaths, single injury, or 100s of dollars in damages) = 1

Very Likely = A
Possible = B
Very Unlikely = C

## PROFILING HAZARD EVENTS

| | |
|---|---|
| **Requirement §201.6(c)(2)(i):** | **[The risk assessment shall include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.** |

Severe Winter and Summer Storm Events

Knox County is subject to severe winter and summer storm events. The entire county is subject to major snowfall events, however, the northern half of the county typically will receive greater snowfall amounts. Again, the entire County can experience a major ice storm, as it did in January 1998, however, the coastal communities on the mainland and on the islands, which contain the vast majority of the population, experience ice storms more frequently. Finally, the entire County is very susceptible to "Northeaster" winter storms and severe coastal summer storms, especially from the very high winds that are involved in such a storm.

The Gulf Stream follows a path up the eastern seaboard bringing major storms with it to the Gulf of Maine. Air streams containing much colder air flows down from Canada and collides with the Gulf Stream over the New England region. There have been three Federally-declared winter storm disaster events in the last 9 years. The worst storm in the past decade occurred in January 1998 and caused $305,292 in damage throughout the entire County. This storm, which nearly destroyed the electrical transmission system in the State of Maine, caused major damage to the forests, covered many roadways with debris and ice, and caused some limited building damages. However, most winter storms in the County are large snow storms which over task the highway snow removal operations and cause localized power outages.

It is expected that a severe winter or summer storm will create damage in Knox County at least once every three years. Storm events are shown in the County Base Map section.

Wildfire

Knox County is subject to wildland fire events. Nearly 85% of the County is forest land and the accessibility by vehicle to many areas is limited. The County has been hit with 165 wildland forest fires from 1995 to 2001. A wildland fire in October 1825 burned 3,000,000 acres in Maine and New Brunswick. The most severe wildland fire in the State's history occurred in October of 1947. This fire burnt 205,678 acres and caused 16 deaths.

All parts of the County are subject to wildland fires, however the northern portion of the county has the least accessibility to the productive forestland due to the lack of roads and development and the southern portion of the County has a larger number of homes and businesses within the Wildland-Urban Interface.

It is expected that a major wildland fire event will cause major destruction in Knox County at least once every decade. Wildfire danger areas are shown on the County Base Maps included in this section.

Flooding

Knox County is subject to riverine, storm surge, and wetland area flooding. The County EMA has reviewed the County's Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) to compile a profile of the flooding hazard in the County. The EMA staff completed research on flooding history in the County and indicated this data on the GIS base maps. The Municipal Base Maps show the areas susceptible to potential flooding from coastal storms. Unfortunately, FEMA has not completed the conversion of the FIRM map data to GIS layer and files, and so the FIRM flood zones have not been illustrated. Analysis was completed using the paper FIRM maps. This research indicated a clear picture of areas and structures most vulnerable to flooding.

There is one river located in Knox County. The St. George River flows through the towns of Appleton, Union, Warren, Thomaston, South Thomaston, Cushing and St. George. There are no dams on the St. George River. Flooding from the St. George river happens on occasion, but it is not severe. There are several dams located at the outlets of lakes and ponds which are very small and would not have a major flooding impact, however, on Megunticook Lake there are two dams, Megunticook East and Megunticook West, that the State has classified as High Hazard dams. If these dams were to fail, it would cause major flooding in downtown Camden. The Town of Camden has addressed this possibility by developing an Emergency Action Plan. It is current and will be revised according to State law every two years. Additionally, there is another High Hazard Dam in Camden which is regulated by FERC. This is the Seabright Dam which the State more thoroughly addresses in the State Dam Program. (See Appendix B for Dam Brochure.)

The most susceptible communities to coastal flooding are Camden, Cushing, Friendship, Isle Au Haut, North Haven, Owl's Head, Rockland, Rockport, St. George, South Thomaston, and Vinalhaven. There is a State of Maine ferry service at Rockland that services the islands of North Haven, Vinalhaven and Matinicus Island Plantation and this service could be impacted by coastal flooding.

The majority of the flood damage in the County is caused by winter runoff in the spring time which undercuts or overtops rural roads. When Maine has an above average snowfall for the winter and then warmer temperatures and rainfall suddenly arrive in the spring, the snow pack melts off quicker then the watersheds can handle. This causes local waterbodies to overflow their boundaries and flood nearby road surfaces. Typically, this road damage is not major, though it can absorb the municipal road maintenance budget for an entire year and does happen in several of the towns every year.

It is expected that a major flood event will cause mostly road damage in Knox County at least once every decade. Flood zones are shown on the Municipal Base Maps included in this section.

## COUNTY BASE MAP

This section contains a base map of the entire geographic area of Knox County. The base maps were completed in ArcInfo GIS format by a student work team from Unity College and contains the following layers:

County and Municipal Boundaries
State and Local Roadways

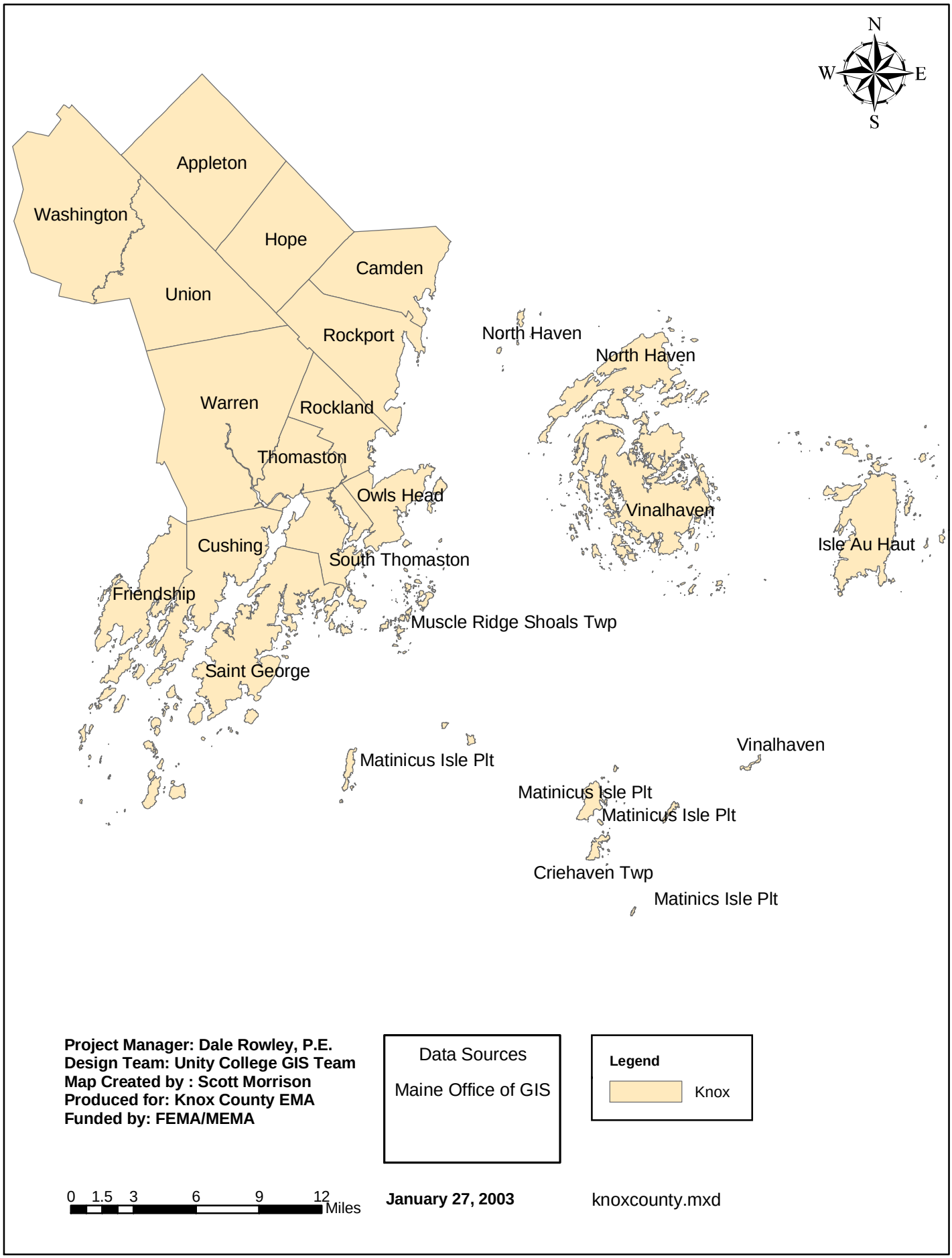
Wildfire Hazard Areas
Winter Storm Hazard Areas

Neither the State of Maine, nor the National Weather Service, maintain data on snowfall and ice storm on a town by town basis. Normally there are only one or two locations within a Maine County that records weather data. For Knox County, the only weather station is located in Rockland. Therefore, the entire county is modeled as one entire hazard area for severe winter storms.

The State of Maine Department of Conservation does not maintain wildland fire data on specific areas within a municipality, but rates each town as Low, Moderate, or High Risk for wildland fires. This risk was determined using the predominant type of trees, the population density, and the number of past wildfires the municipality has experienced in the past. Therefore, each town is modeled as one entire hazard area for wildfires.

The County Maps may be used to orient the user of this plan to the locations of the municipalities in relation to each other.

# Knox County Hazard Mitigation Plan




**Project Manager: Dale Rowley, P.E.**
**Design Team: Unity College GIS Team**
**Map Created by : Scott Morrison**
**Produced for: Knox County EMA**
**Funded by: FEMA/MEMA**

Data Sources

Maine Office of GIS

**Legend**

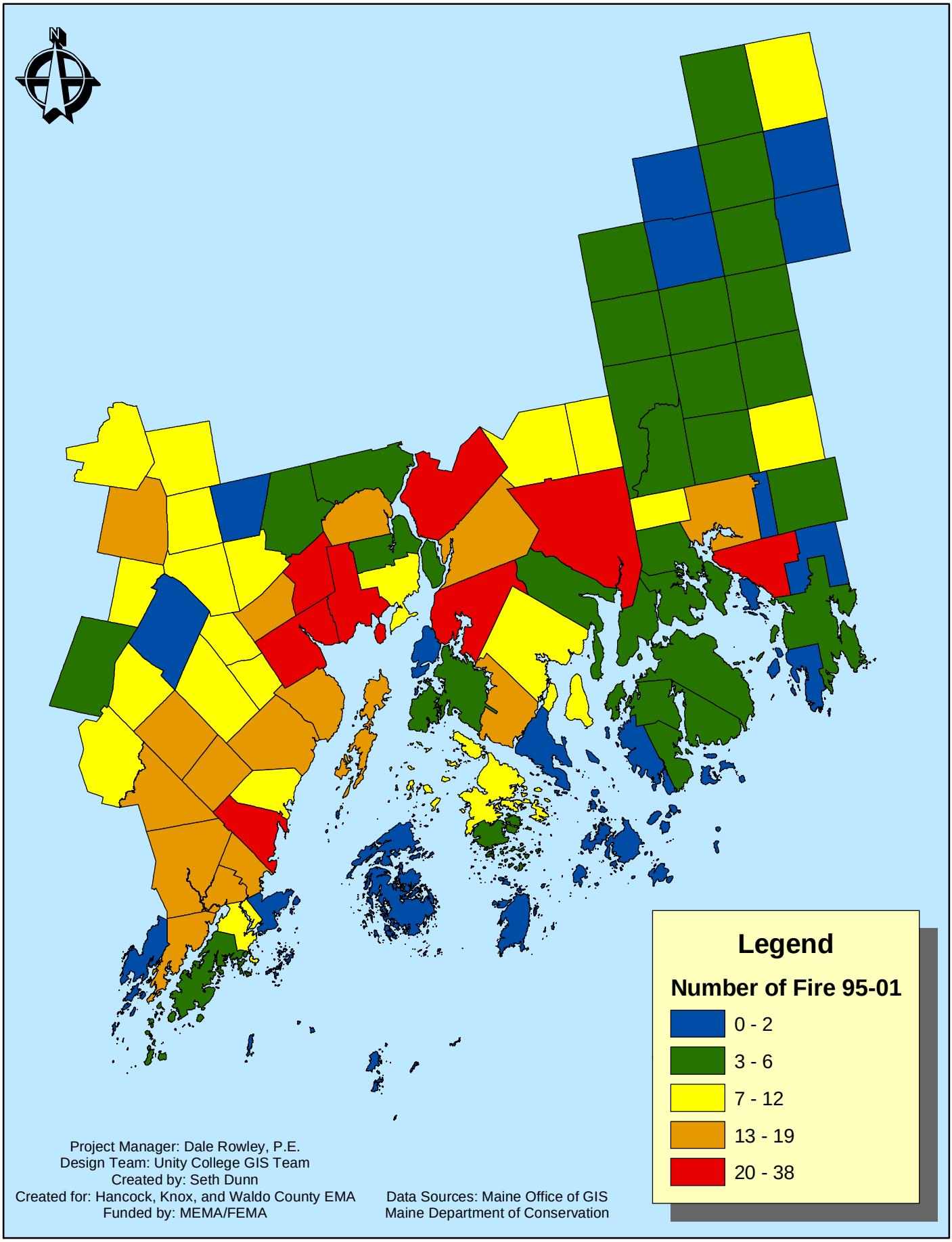
Knox

0 1.5 3 6 9 12 Miles

**January 27, 2003**

knoxcounty.mxd

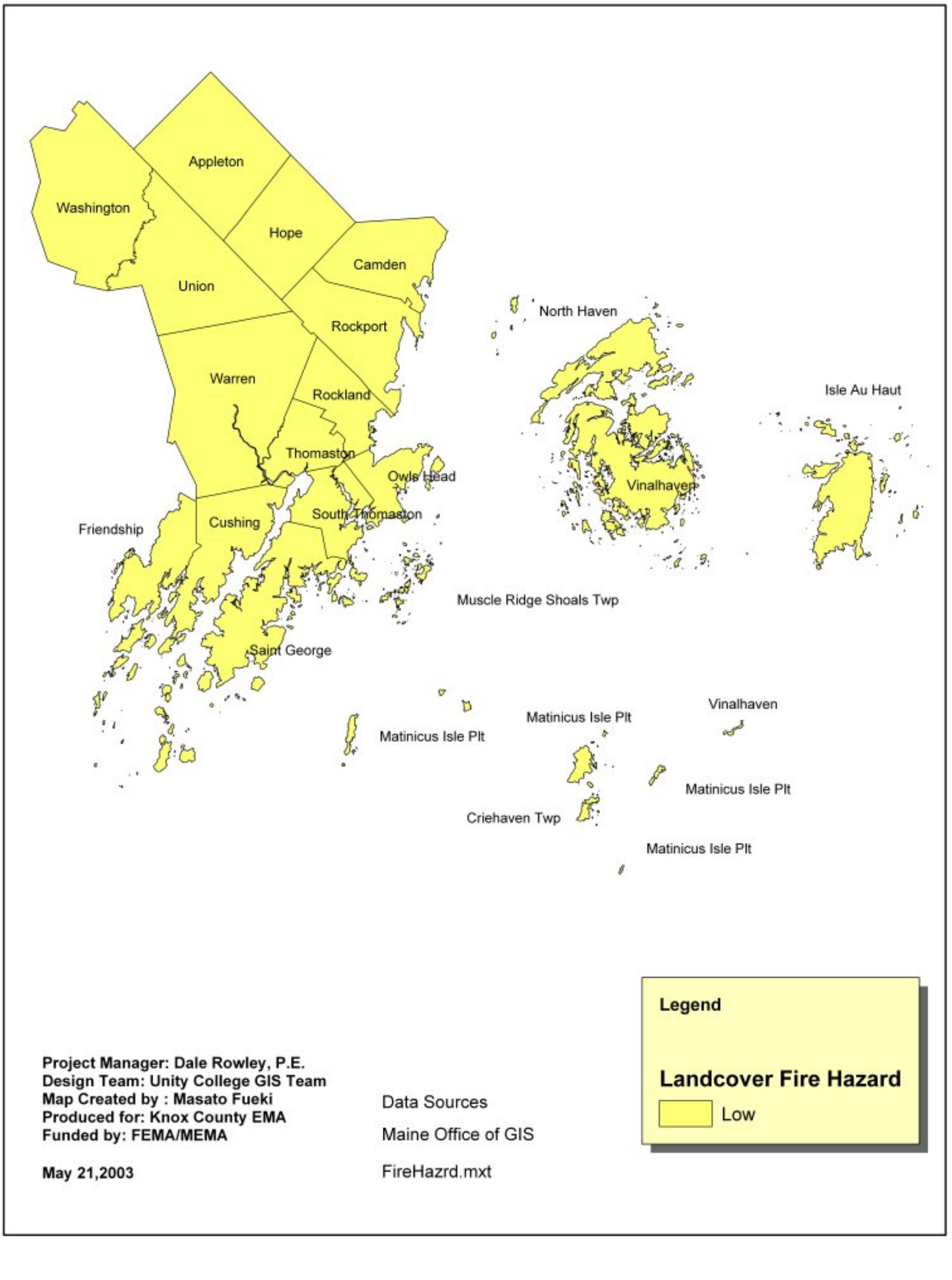
# Number of Fires
# Hancock, Knox, and Waldo County
# 1995-2001




Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Created by: Seth Dunn
Created for: Hancock, Knox, and Waldo County EMA
Funded by: MEMA/FEMA

Data Sources: Maine Office of GIS
Maine Department of Conservation

# Knox County Fire Hazard by Landcover




**Project Manager: Dale Rowley, P.E.**
**Design Team: Unity College GIS Team**
**Map Created by : Masato Fueki**
**Produced for: Knox County EMA**
**Funded by: FEMA/MEMA**

**May 21,2003**

Data Sources

Maine Office of GIS

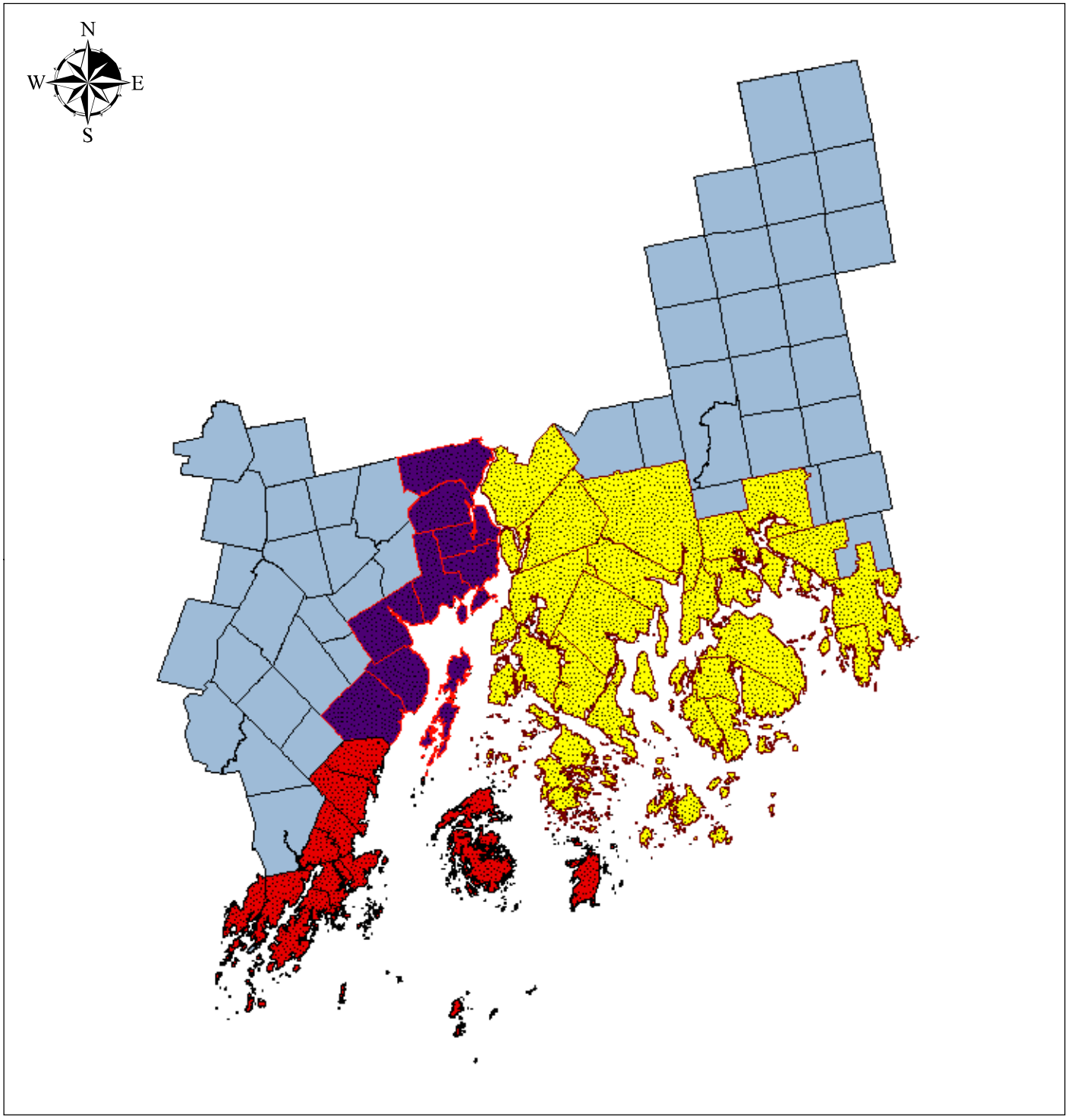
FireHazrd.mxt

**Legend**

**Landcover Fire Hazard**

Low

# Hancock, Knox & Waldo Counties
# Severe Winter Storm Risk Map




## Legend

- Hancock County Severe Icing Risk
- Knox County Severe Icing Risk
- Waldo County Severe Icing Risk
- Heavy Snow-fall Risk

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Created by: Seth Dunn
Created for: Hancock County, Knox County, Waldo County Hazard Mitigation Plan
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.19.03

## MUNICIPAL BASE MAPS

This section contains base maps of the 18 towns and cities of Knox County. The maps were completed in ArcInfo GIS format by a student work team from Unity College and contain the following layers:

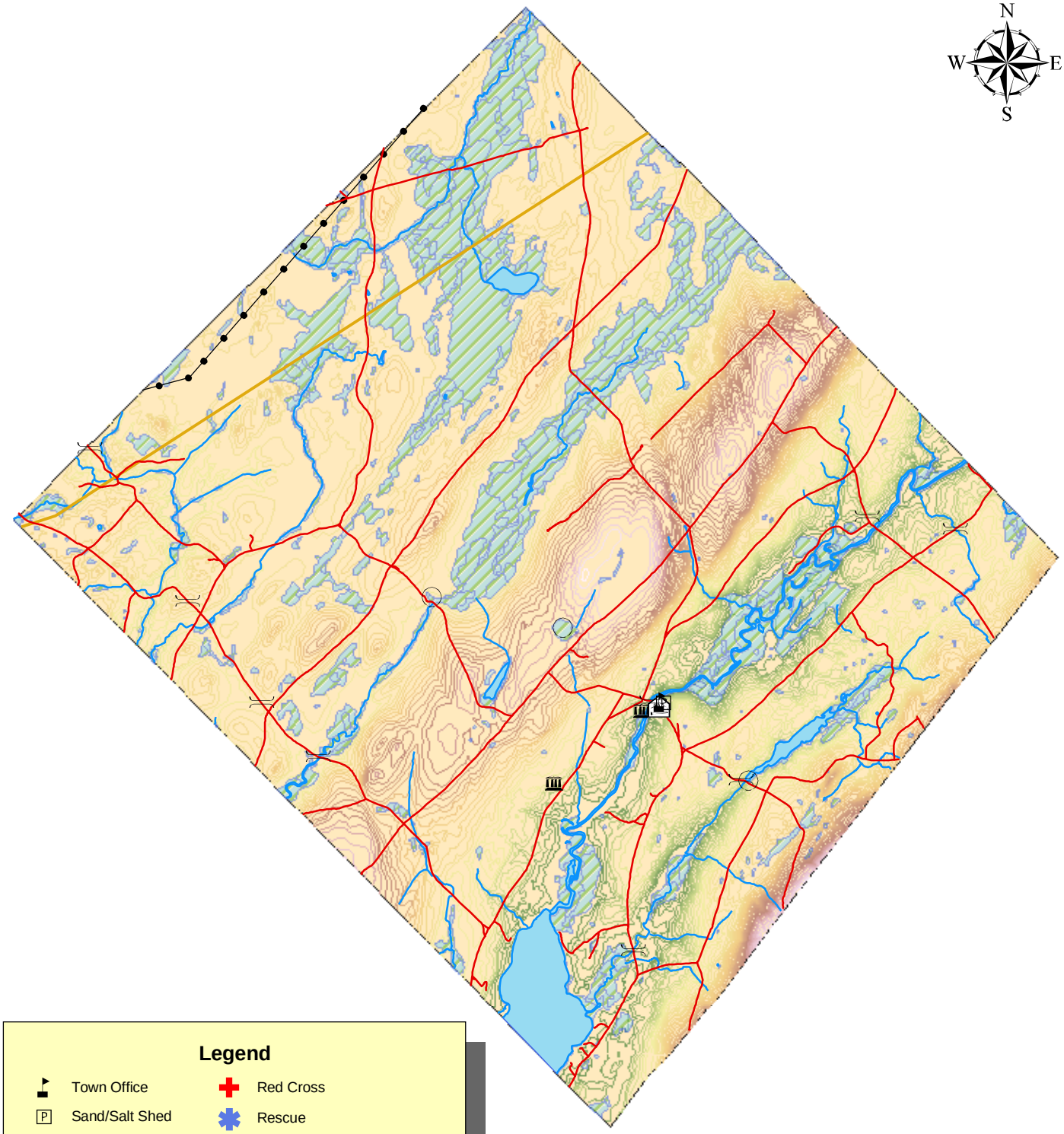
Municipal Boundaries
State and Local Roadways
USGS Topographical Contours
Lakes, Ponds, Rivers, Streams
Locations of critical facilities

FEMA/ACE Hurricane Surge Inundation

The purpose of these maps is to graphically identify those facilities that overlap with costal flood surge zone hazard areas in order to determine what assets are potentially impacted.

A large majority of the Knox County municipalities do not maintain Municipal Comprehensive Land Use Plans in GIS format.

# Knox County Hazard Mitigation Plan
# Town of Appleton Base Map



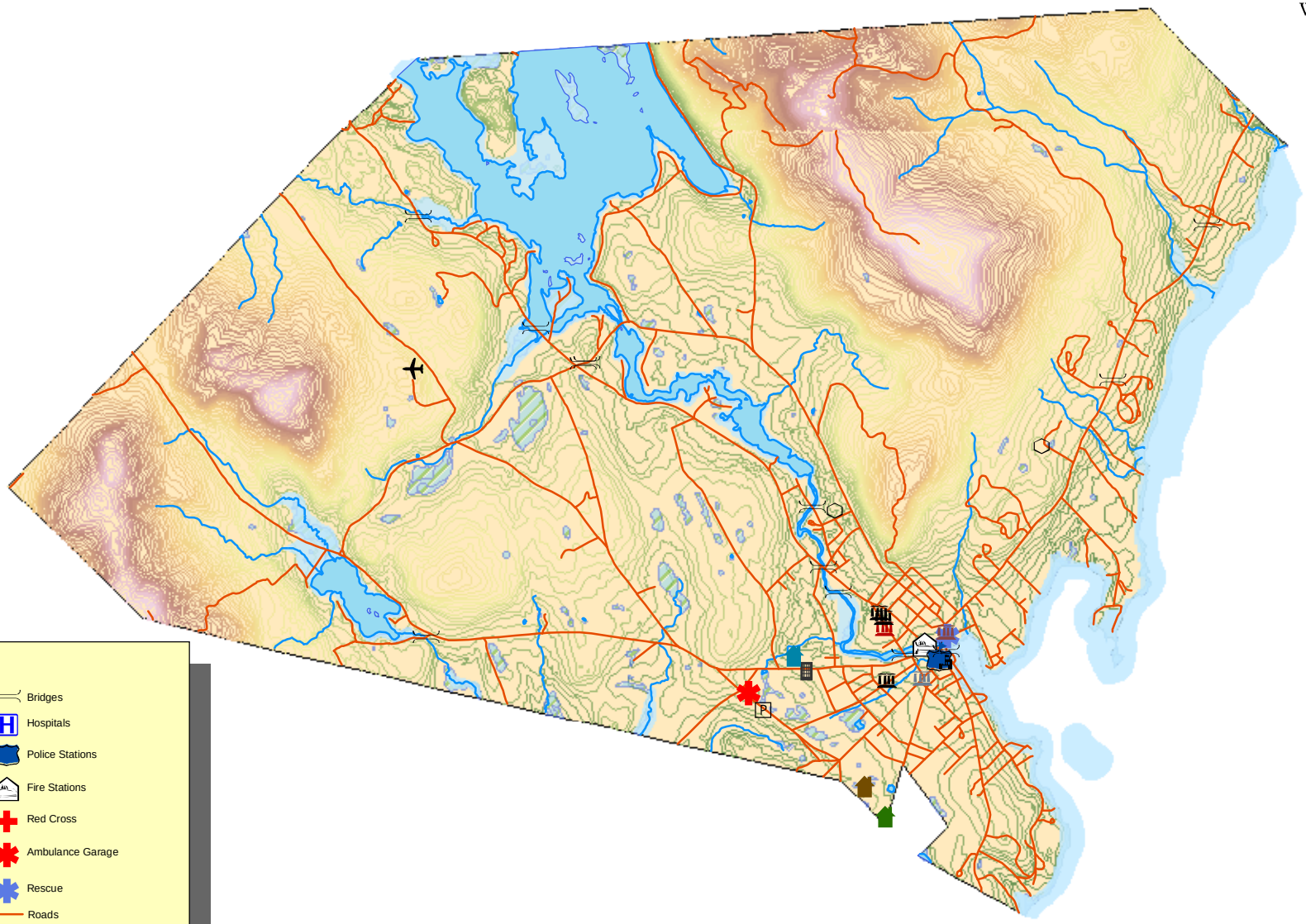

**Legend**

- Town Office
- Sand/Salt Shed
- Airports
- Armories
- Bridges
- County EMA Offices
- Dams
- Fire Stations
- Hospitals
- Police Stations
- Red Cross
- Rescue
- Schools/Libraries
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Wetland
- Appleton

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.26.03

# Knox County Hazard Mitigation Plan
# City of Camden Base Map



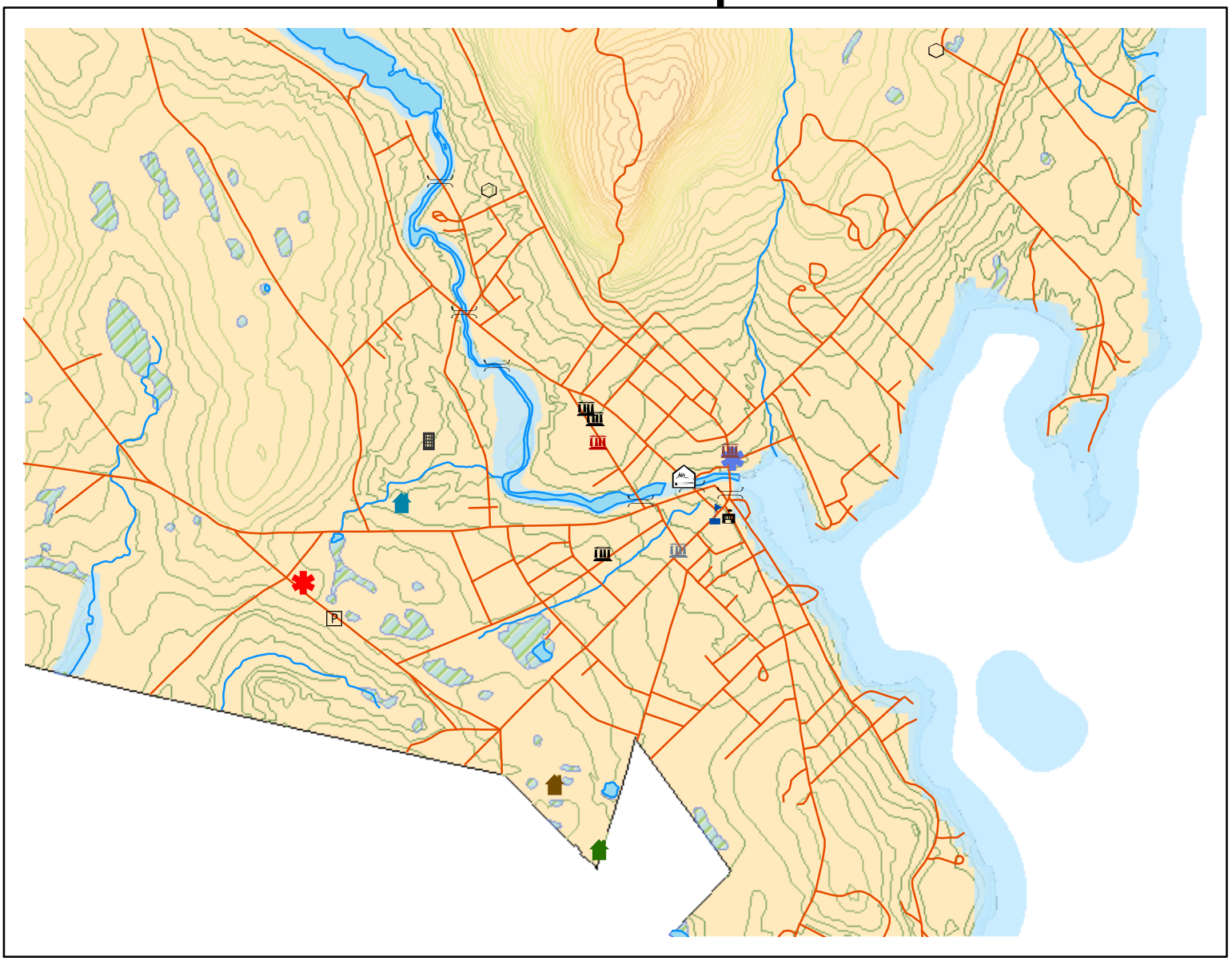

**Legend**

- Schools/Libraries
- Camden Grand School
- Elm Street School
- Public Library
- Windward Gardens Residential Care
- Anderson Inn Residential Care
- Megunticook Residential Care
- Camden Apartments Residential Care
- Route 52 Water Tank
- Belfast Road Water Tank
- Municipal Office/Police Station
- Municipal Public Works Garage
- US Post Office
- County EMA Office
- Armories
- Airports
- Bridges
- Hospitals
- Police Stations
- Fire Stations
- Red Cross
- Ambulance Garage
- Rescue
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Flood Zone
- Wetland
- Camden

07.03.03

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS
Integrated Mapping Services, Inc

# Knox County Hazard Mitigation Plan
# City of Camden
# Detail Map



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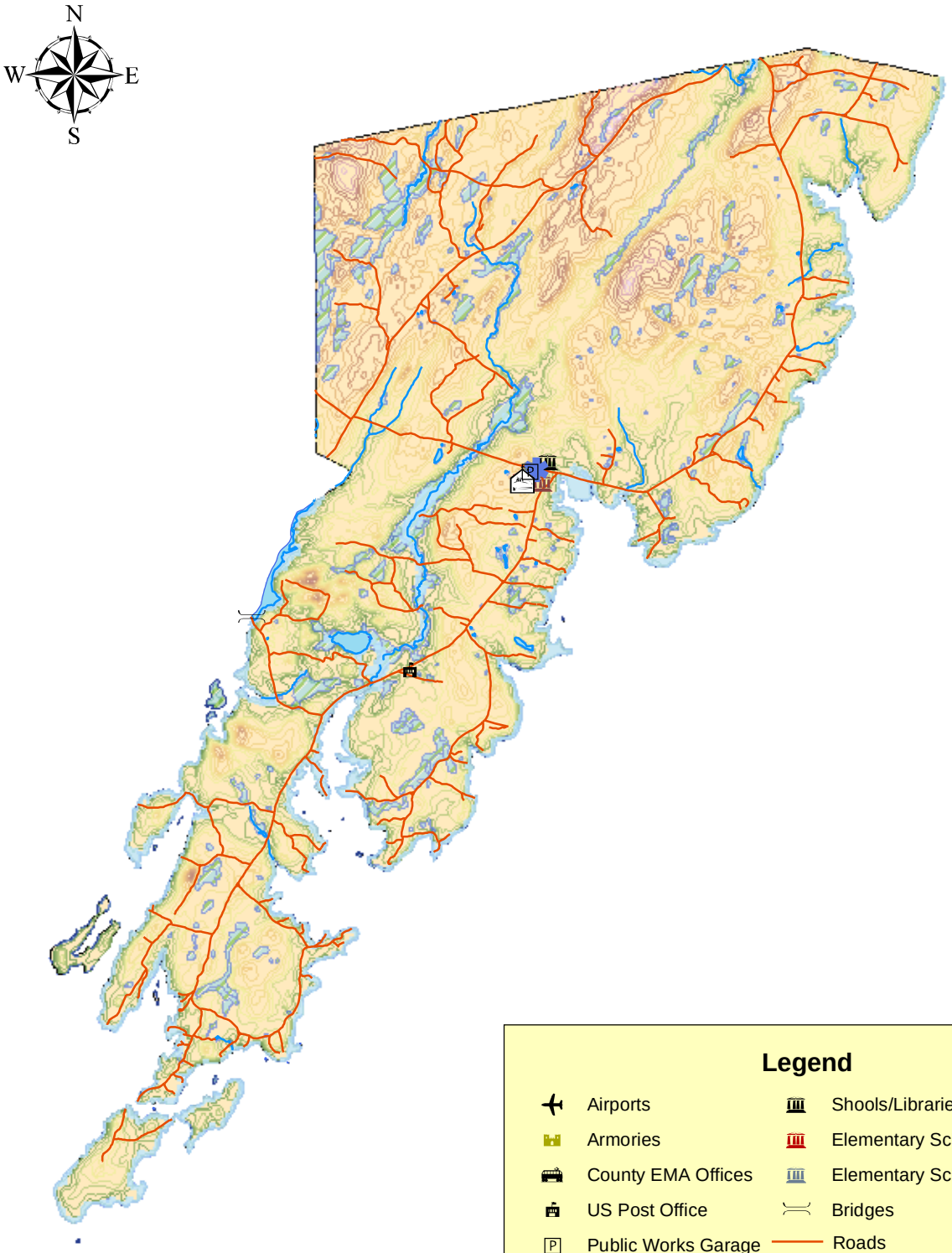
**Legend**

- Schools/Libraries
- Camden Grand School
- Elm Street School
- Public Library
- Camden Apartments Residential Care
- Windward Gardens Residential Care
- Megunticook Residential Care
- Anderson Inn Residential Care
- US Post Office
- Municipal Public Works Garage
- Municipal Office/Police Station
- County EMA Office
- Armories
- Fire Stations
- Belfast Road Water Tank
- Route 52 Water Tank
- Airports
- Bridges
- Hospitals
- Red Cross
- Ambulance Garage
- Rescue/Ambulance Services
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Flood Zone
- Wetland
- Camden

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS
Integrated Mapping Services, Inc

06.26.03

# Knox County Hazard Mitigation Plan
# Town of Cushing Base Map



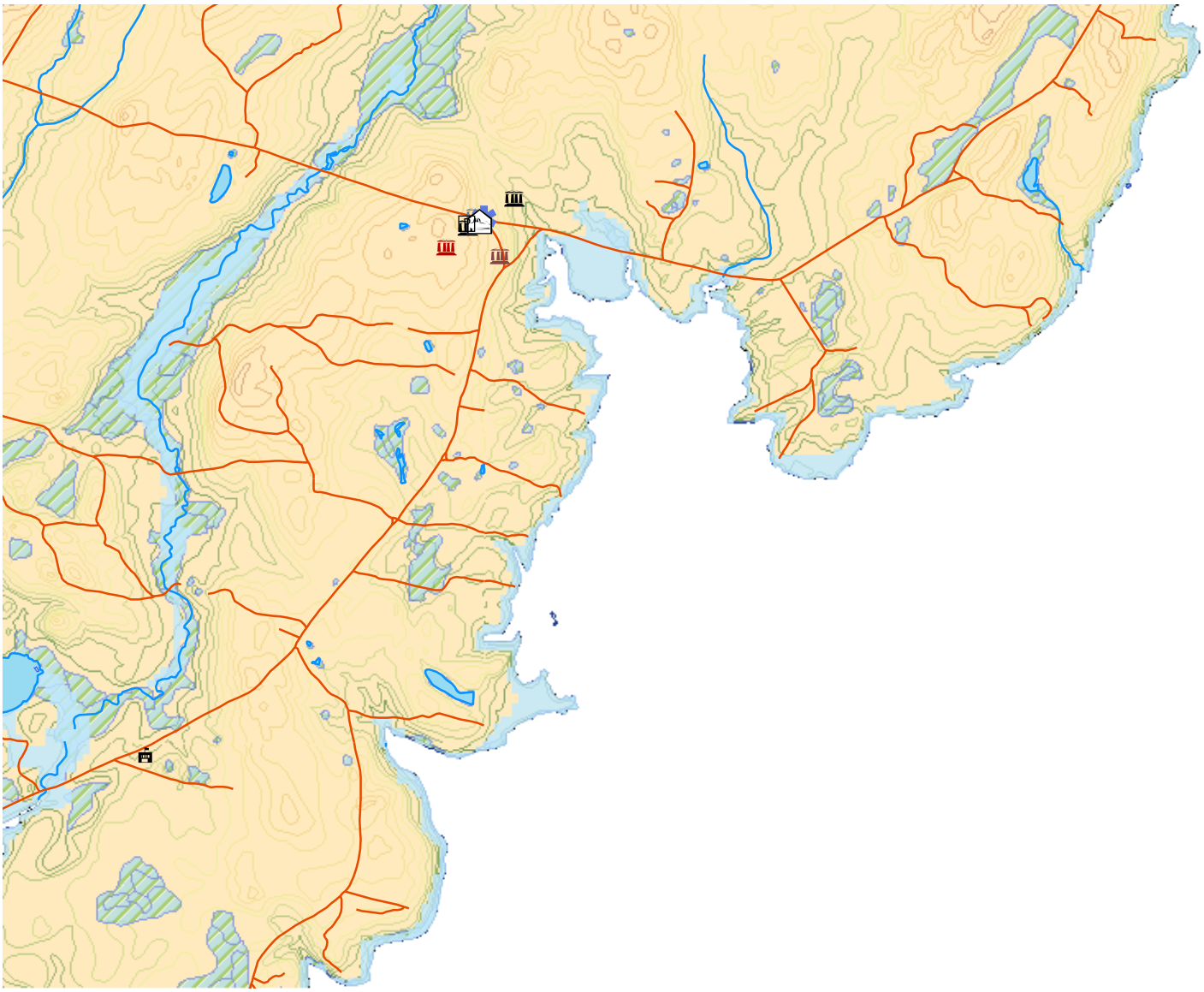

## Legend

- Airports
- Armories
- County EMA Offices
- US Post Office
- Public Works Garage
- Hospitals
- Police Stations
- Fire Stations
- Red Cross
- Rescue
- Public Library
- Shools/Libraries
- Elementary School (New)
- Elementary School (Old)
- Bridges
- Roads
- Electristic Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Cushing

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.26.03

# Knox County Hazard Mitigation Plan
# Town of Cushing
# Detail Map



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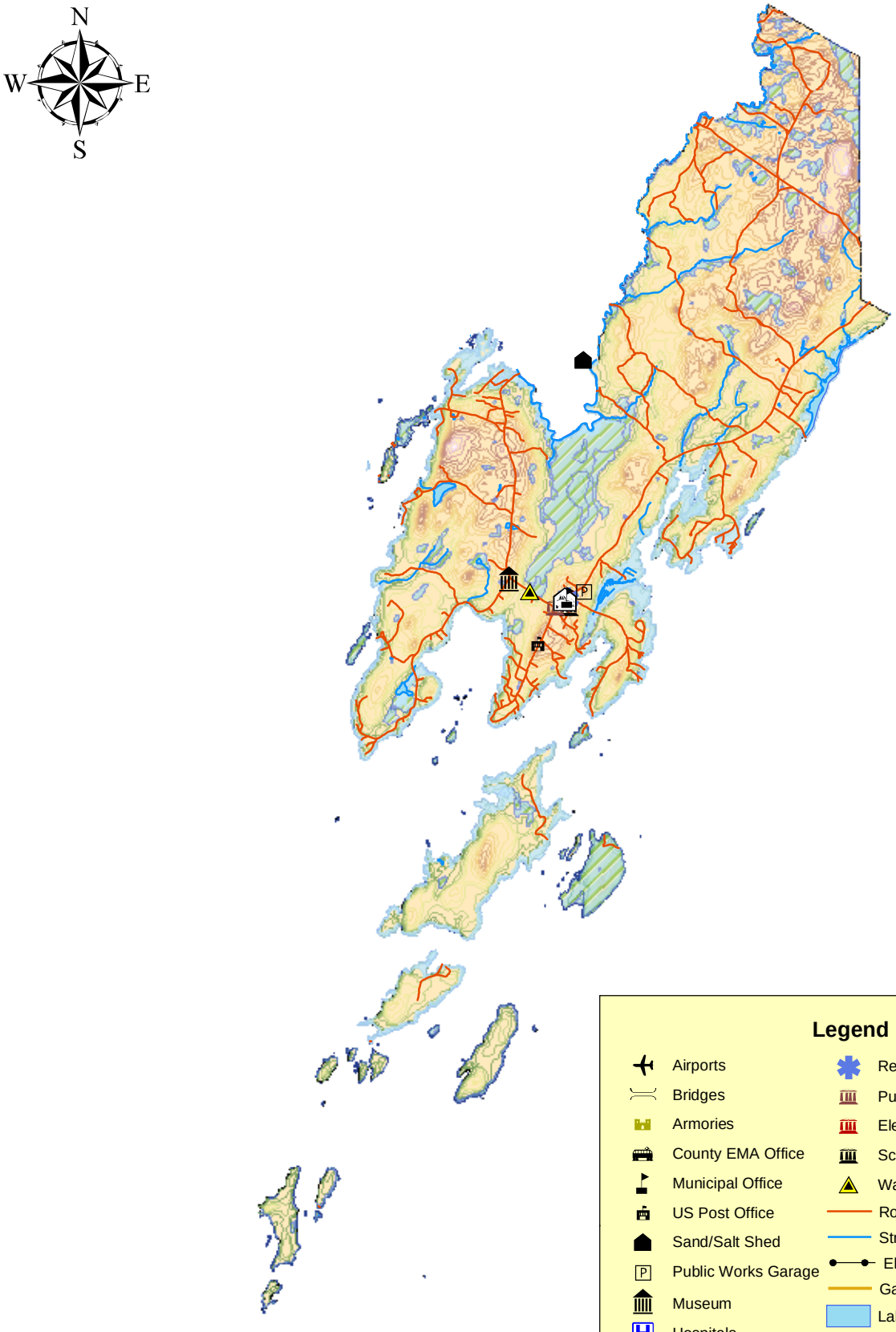
**Legend**

- Airports
- Armories
- County EMA Offices
- US Post Office
- Public Works Garage
- Hospitals
- Police Stations
- Fire Stations
- Red Cross
- Rescue
- Public Library
- Shools/Libraries
- Elementary School (New)
- Elementary School (Old)
- Bridges
- Roads
- Electristic Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Cushing

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.26.03

# Know County Hazard Mitigation Plan
# Town of Friendship Base Map



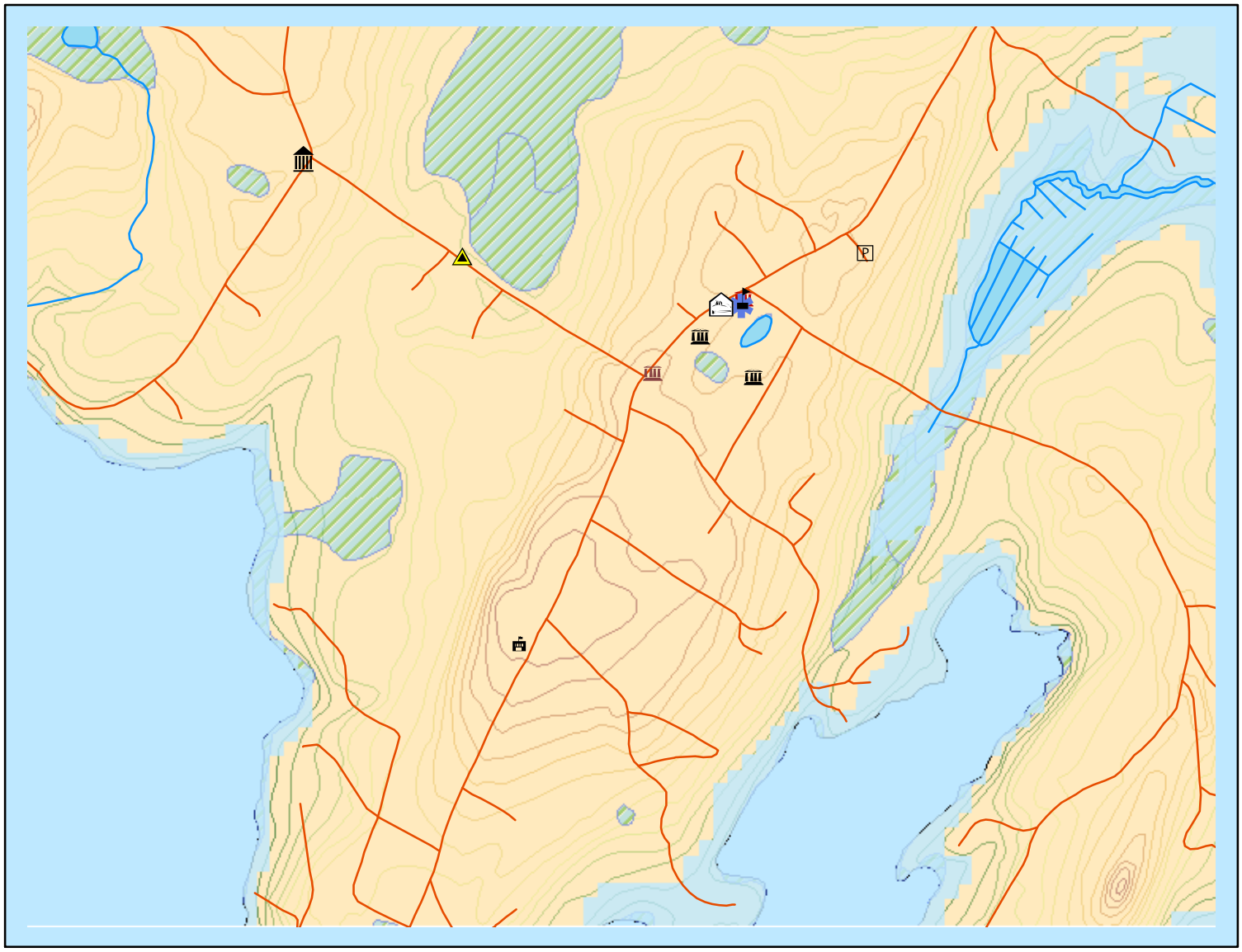

**Legend**

- Airports
- Bridges
- Armories
- County EMA Office
- Municipal Office
- US Post Office
- Sand/Salt Shed
- Public Works Garage
- Museum
- Hospitals
- Police Stations
- Fire Stations
- Red Cross
- Rescue/Ambulance Services
- Public Library
- Elementary School
- Schools/Libraries
- Water Treatment Plant
- Roads
- Streams
- Electric Transportation Lines
- Gas Transportation Lines
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Friendship

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.26.03

# Know County Hazard Mitigation Plan
# Town of Friendship
# Detail Map



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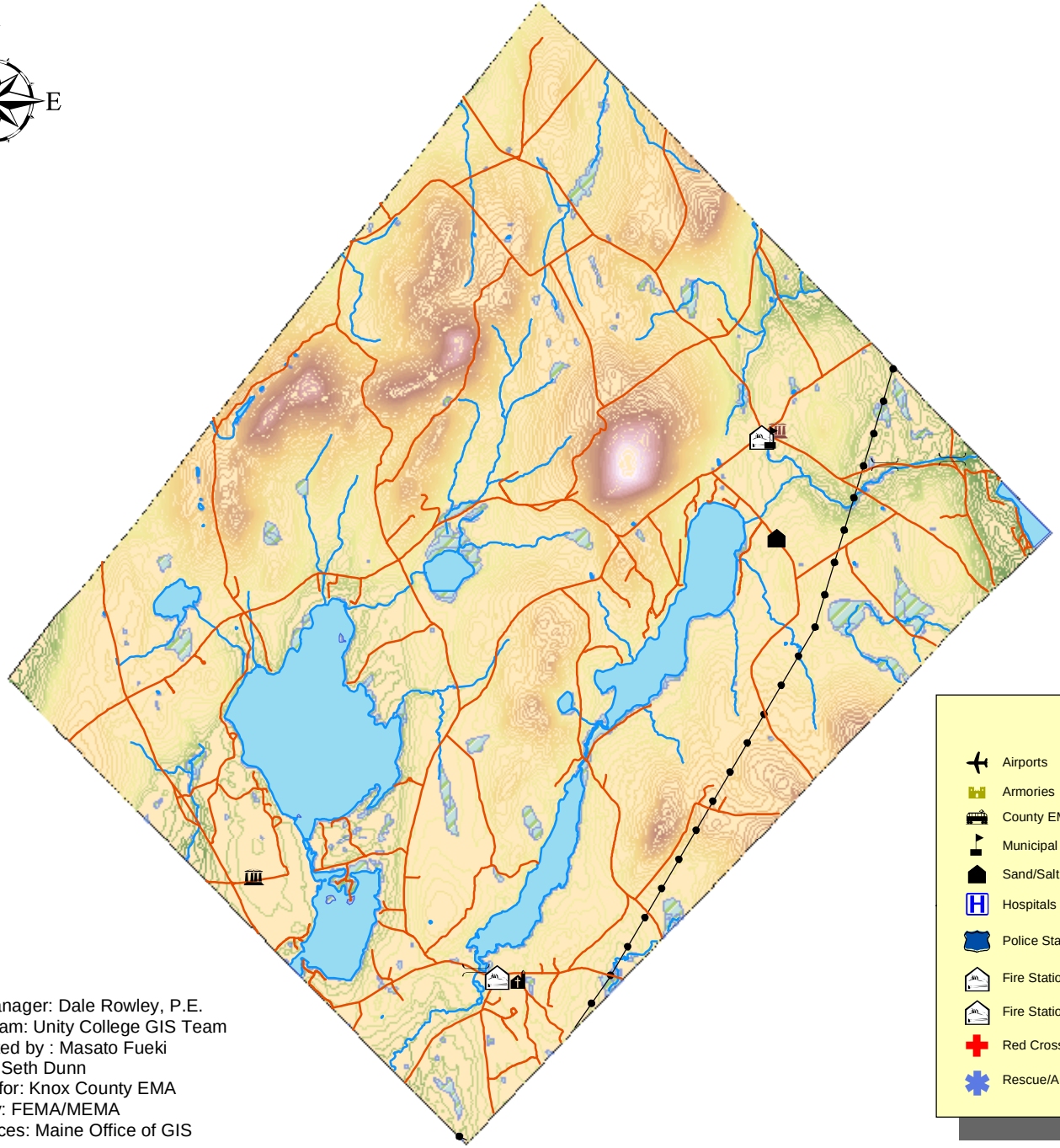
**Legend**

- Airports
- Bridges
- Armories
- County EMA Office
- Municipal Office
- US Post Office
- Sand/Salt Shed
- Public Works Garage
- Museum
- Hospitals
- Police Stations
- Fire Stations
- Red Cross
- Rescue/Ambulance Services
- Public Library
- Elementary School
- Schools/Libraries
- Water Treatment Plant
- Roads
- Streams
- Electric Transportation Lines
- Gas Transportation Lines
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Friendship

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.26.03

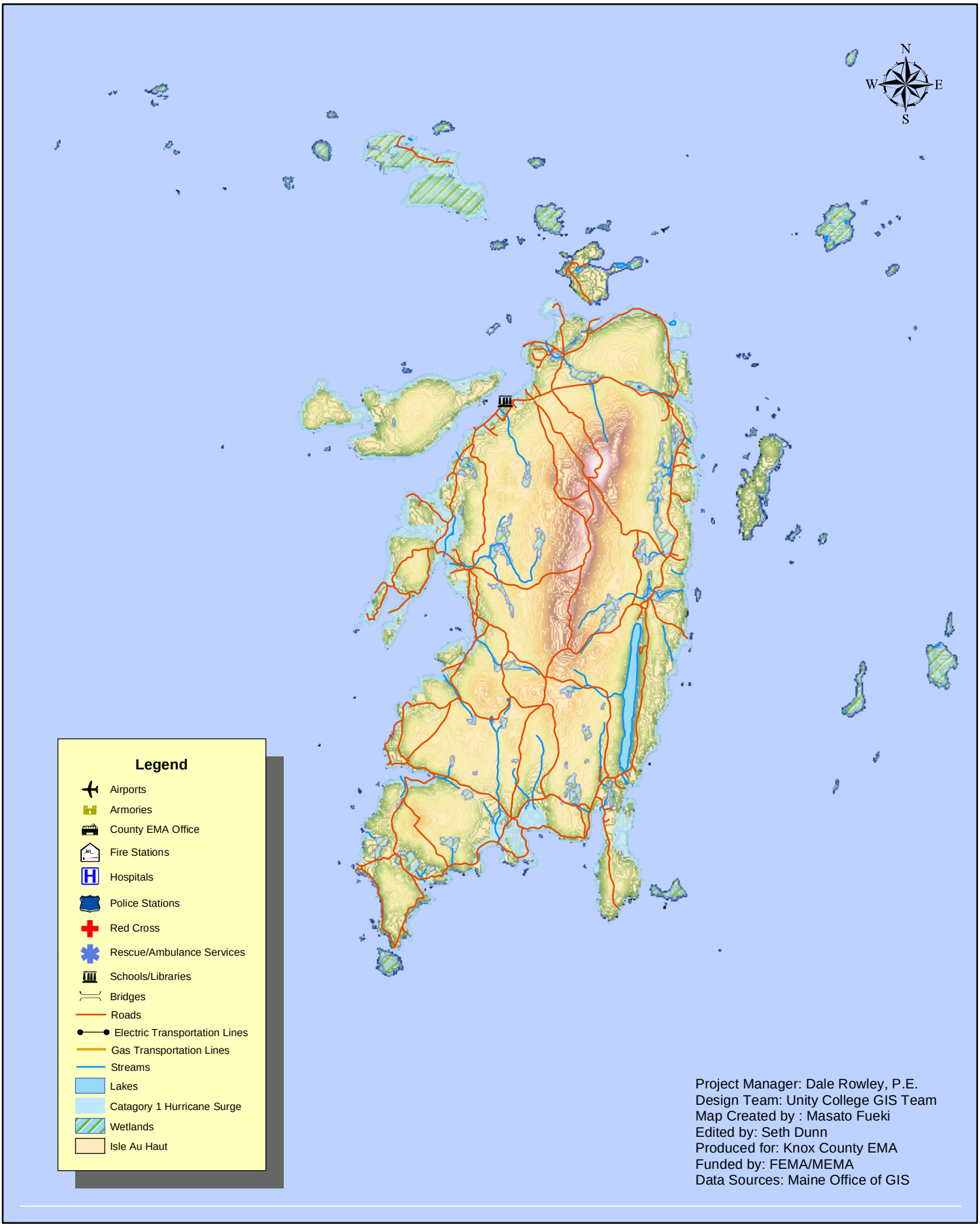
# Knox County Hazard Mitigation Plan
# Town of Hope Base Map




Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.26.03

# Knox County Hazard Mitigation Plan
# Town of Isle Au Haut Base Map




Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

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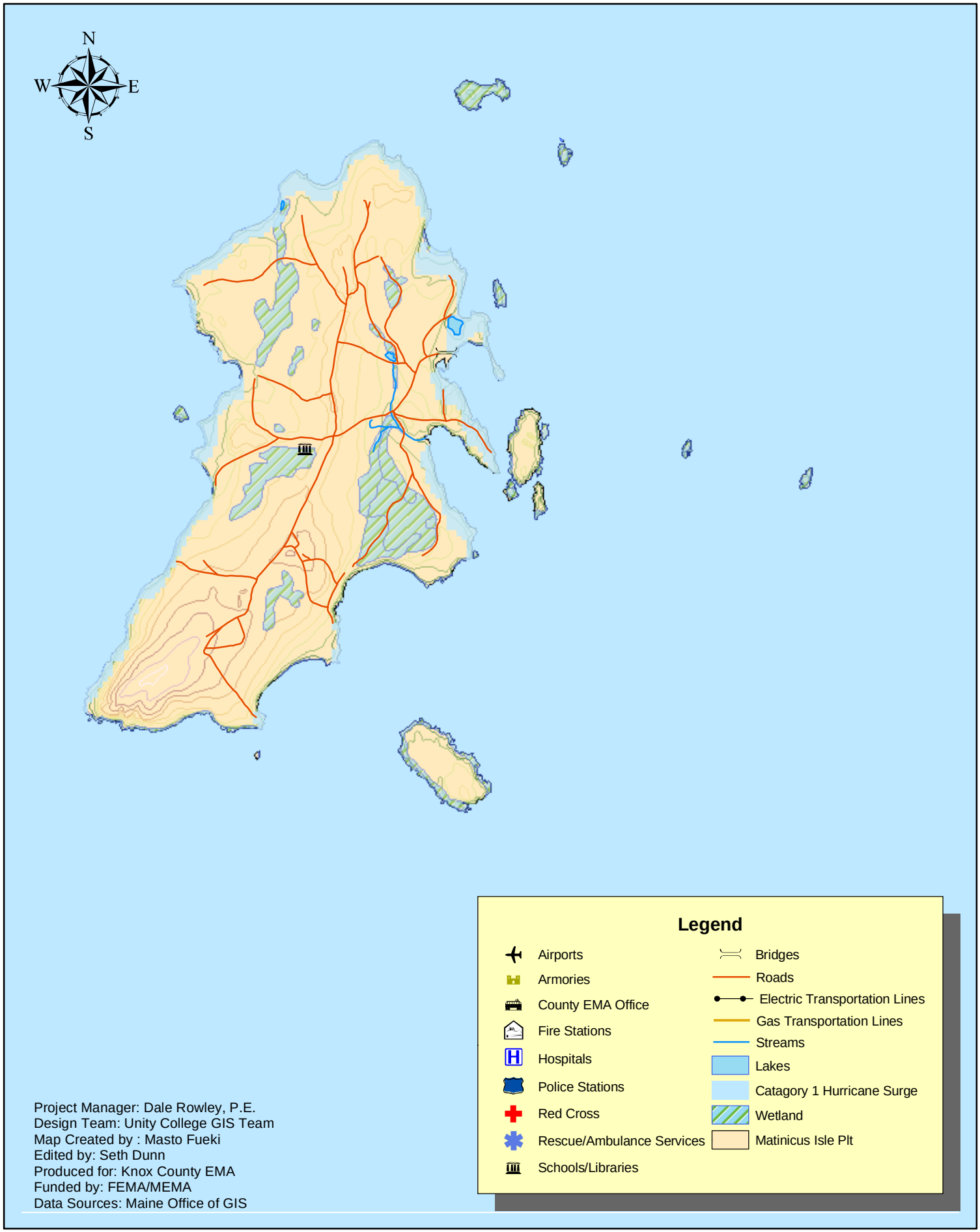
# Knox County Hazard Mitigation Plan
# Matinicus Isle Plantation Base Map




Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masto Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

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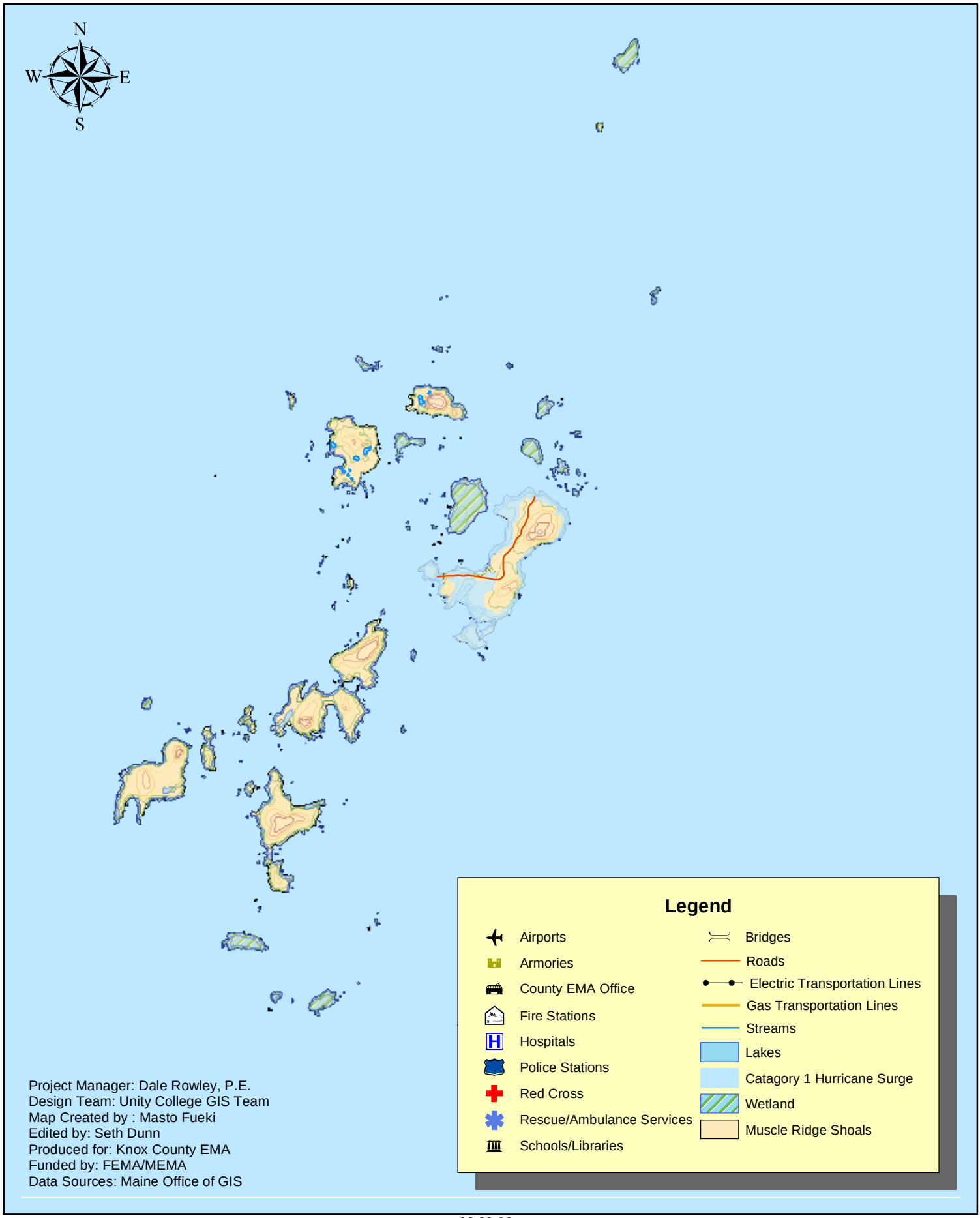
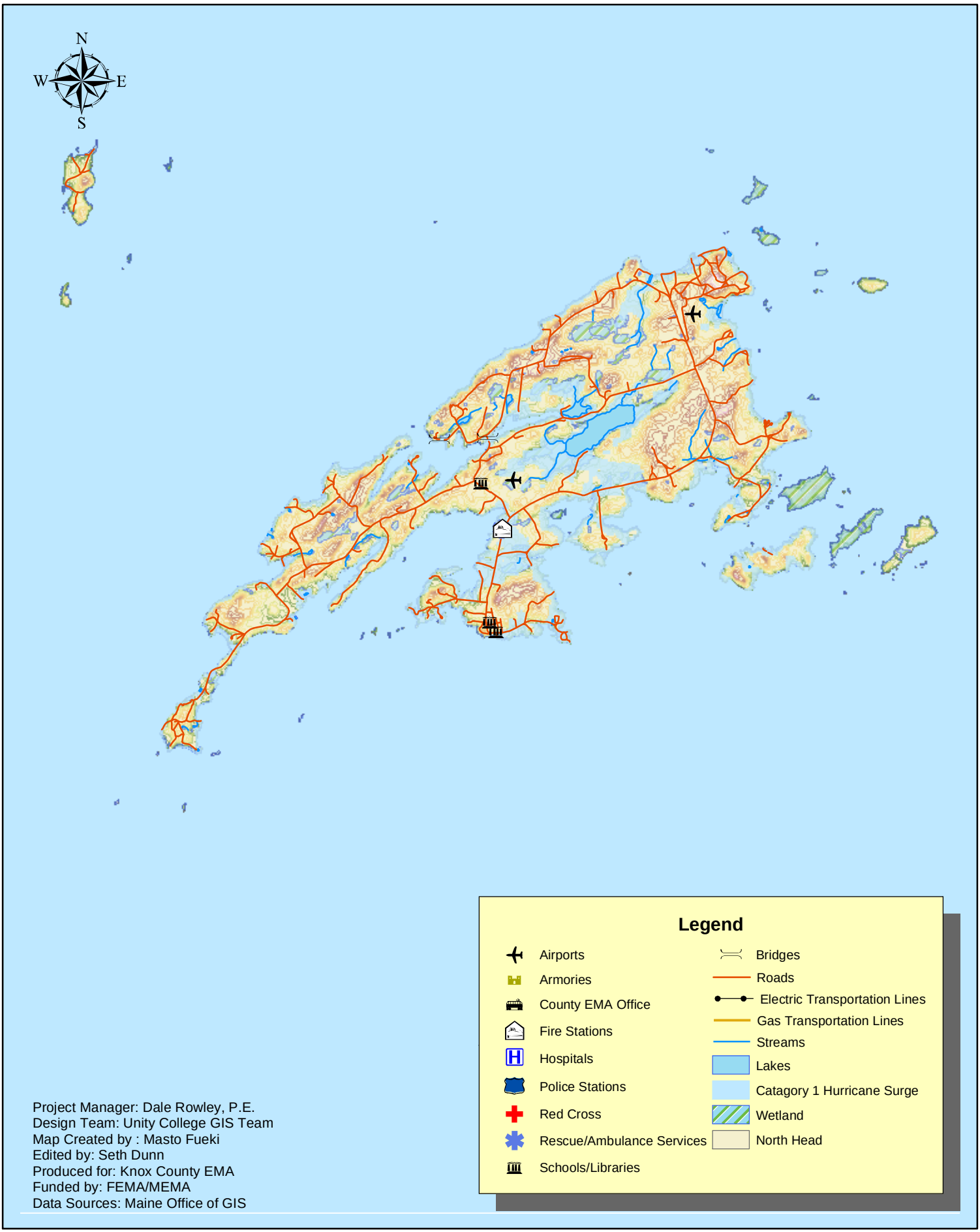
# Knox County Hazard Mitigation Plan
# Town of Muscle Ridge Shoals Base Map




Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masto Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

# Knox County Hazard Mitigation Plan
# Town of North Haven Base Map




Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masto Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

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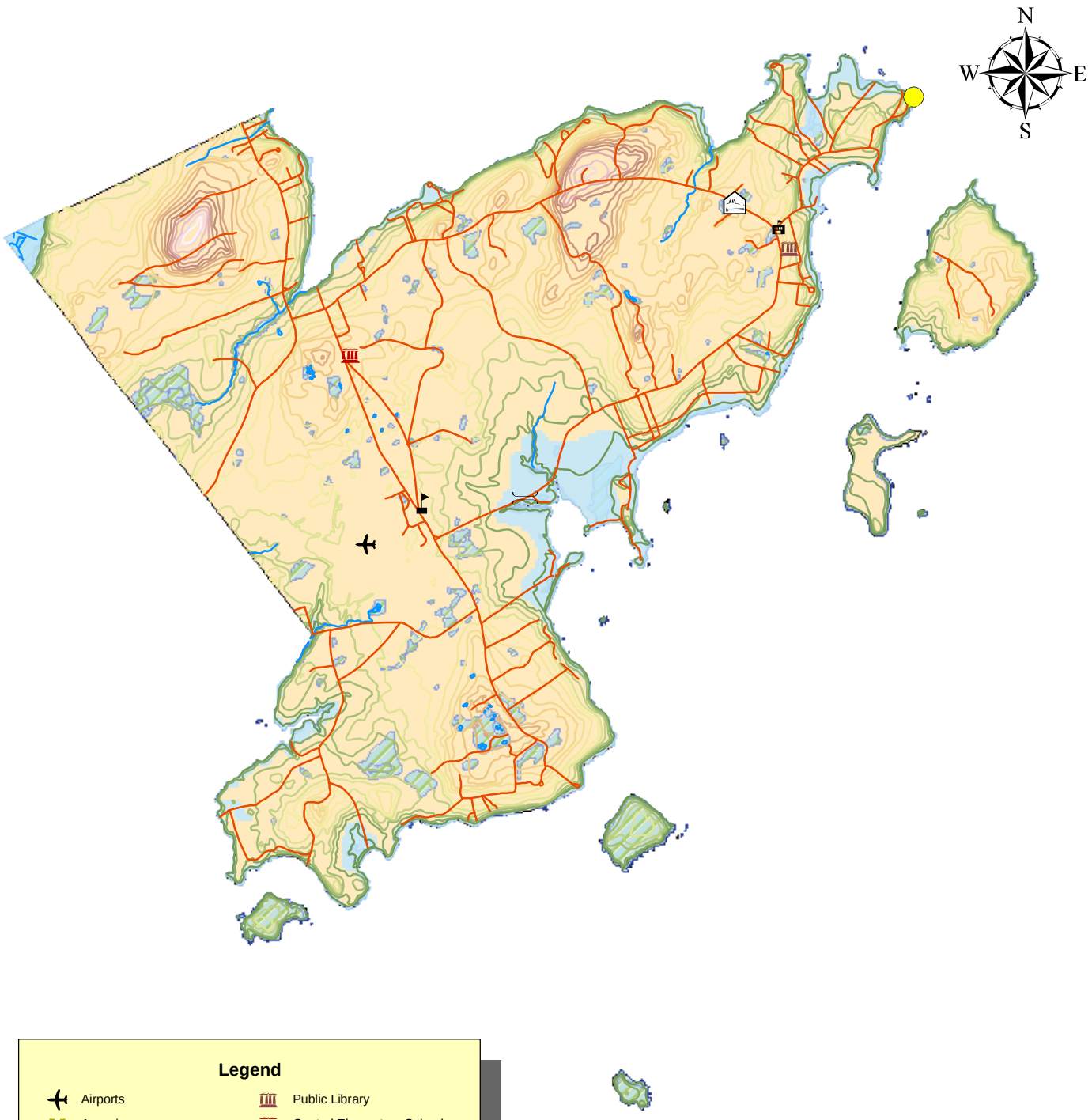
# Knox County Hazard Mitigation Plan
# Town of Owls Head Base Map



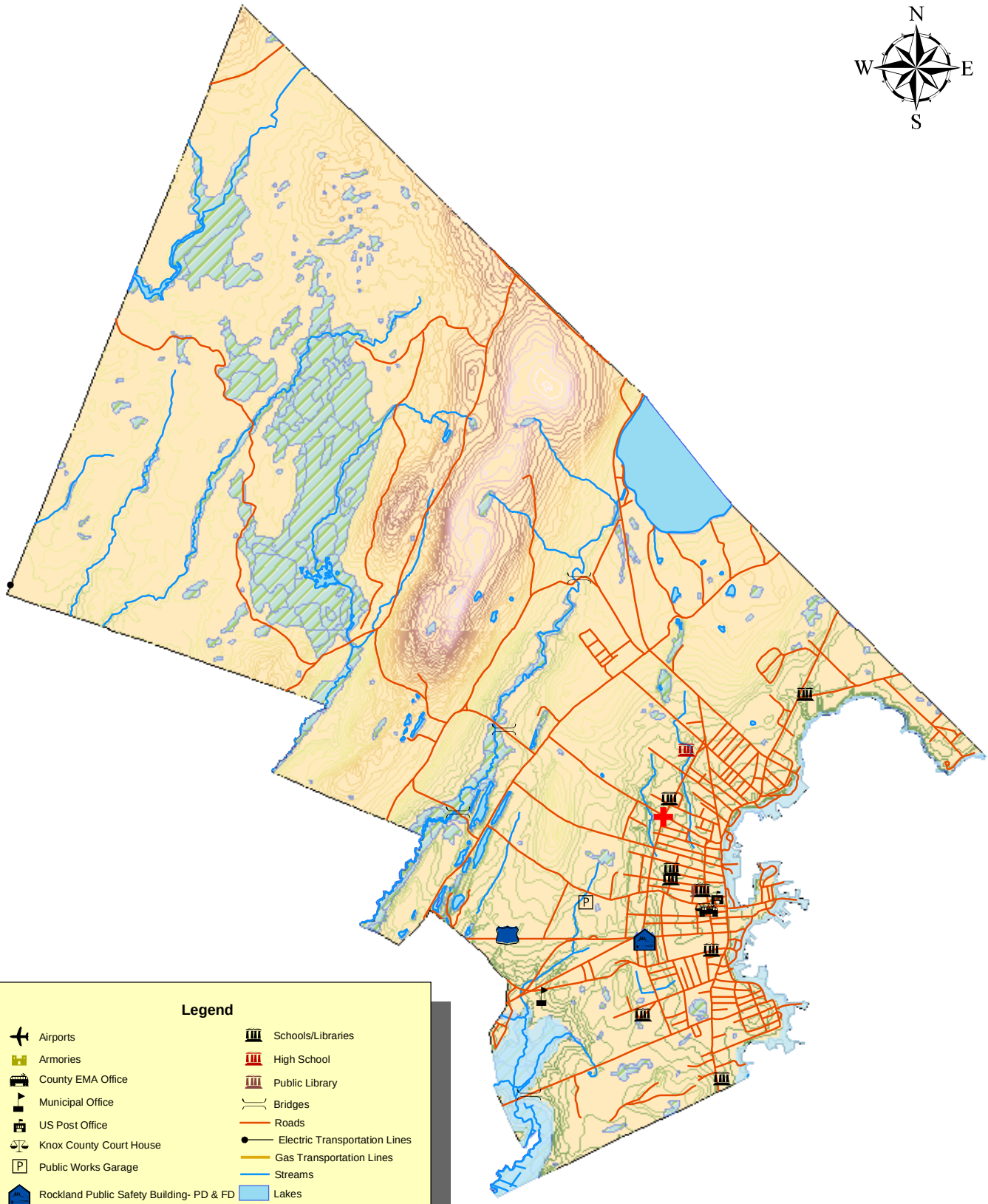

**Legend**

- Airports
- Armories
- County EMA Office
- Municipal Office
- US Post Office
- Light House
- Hospitals
- Police Stations
- Fire Stations
- Red Cross
- Rescue/Ambulance Services
- Public Library
- Central Elementary School
- Bridges
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Owls Head

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.26.03

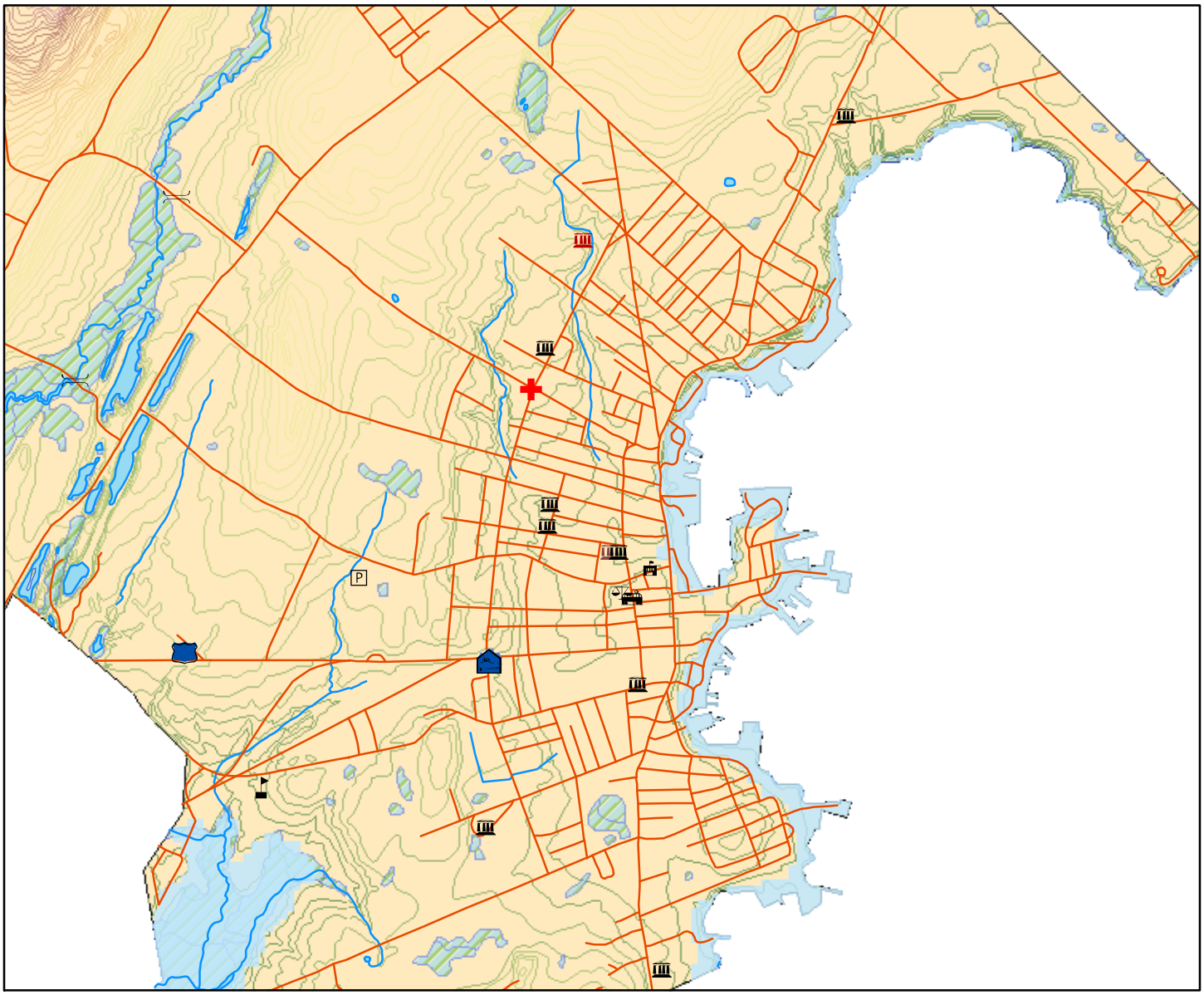
# Knox County Hazard Mitigation Plan
# City of Rockland Base Map




Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.27.03

# Knox County Hazard Mitigation Plan
# City of Rockland
# Detail Map



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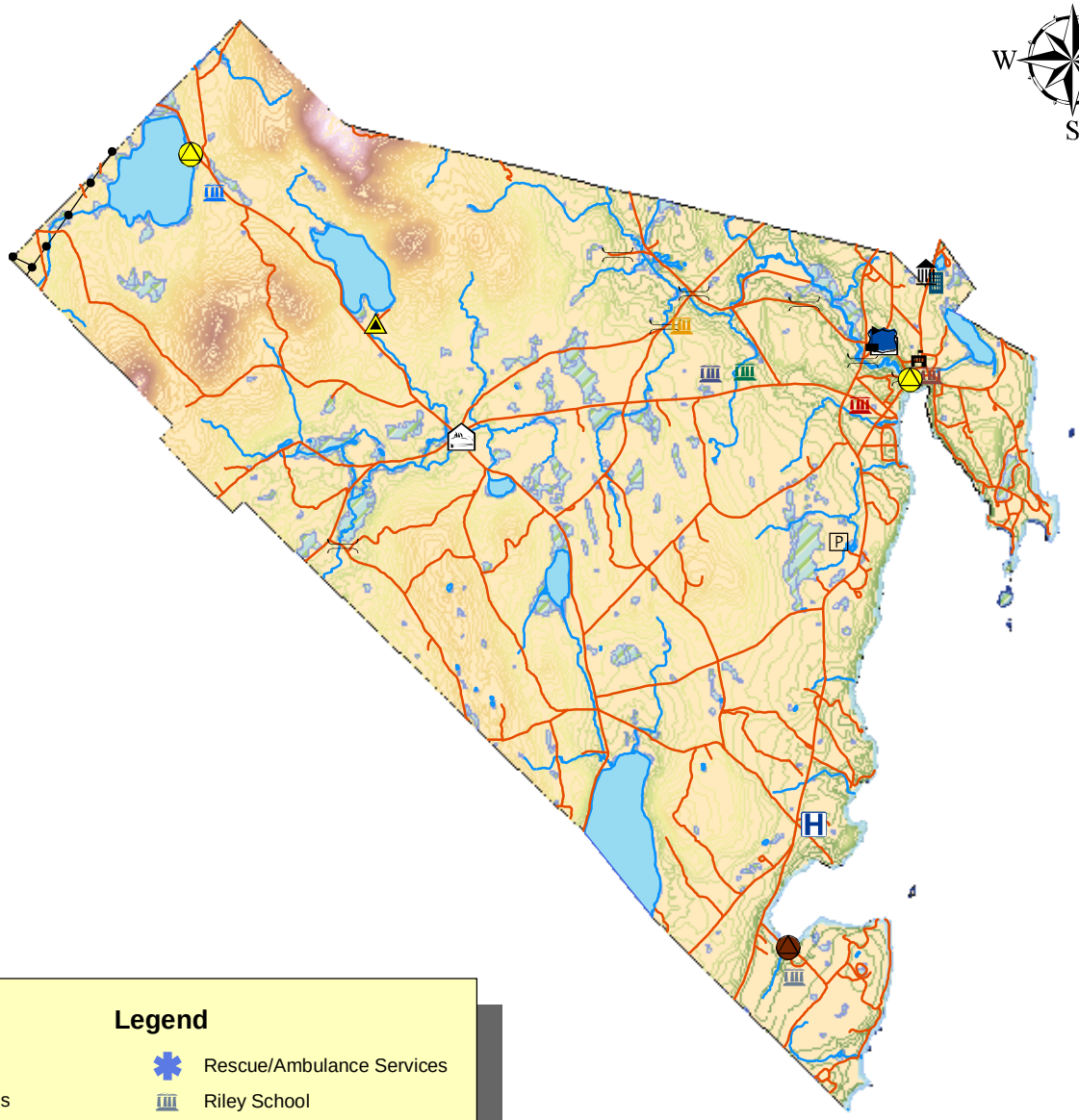
**Legend**

- Airports
- Armories
- County EMA Office
- Municipal Office
- Knox County Court House
- US Post Office
- Public Works Garage
- Rockland Public Safety Building- PD & FD
- Hospitals
- Police Stations
- Red Cross
- Rescue
- Schools/Libraries
- High School
- Public Library
- Bridges
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Rockland

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.27.03

# Knox County Hazard Mitigation Plan
# Town of Rockport Base Map



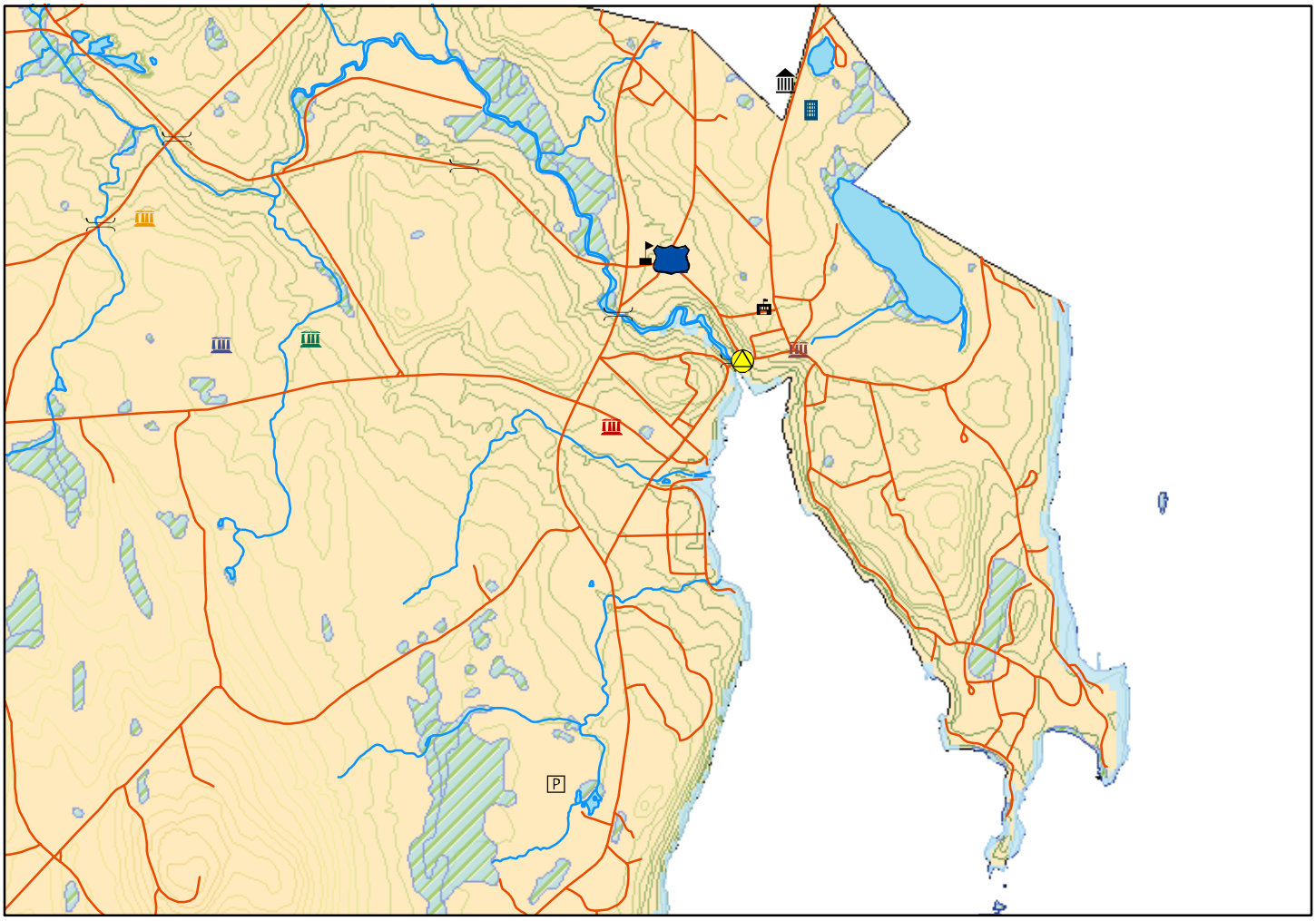

## Legend

- Airports
- Armories
- County EMA Office
- US Post Office
- Historical Opera House
- Municipal Office
- Penobscot Bay YMCA
- Public Works Garage
- Water Pump Station
- Water Pump Station
- Sewer Treatment Plant
- Sewer Pump Station
- Police Stations
- Fire Station
- Fire Station- West
- Red Cross
- Hospital
- Rescue/Ambulance Services
- Riley School
- Montisorri School
- Harbor School
- Camden Hills High School
- Ashwood School
- Rockport Elementary School
- Public Library
- Bridges
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Rockport

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.27.03

# Knox County Hazard Mitigation Plan
# City of Rockport
# Detail Map



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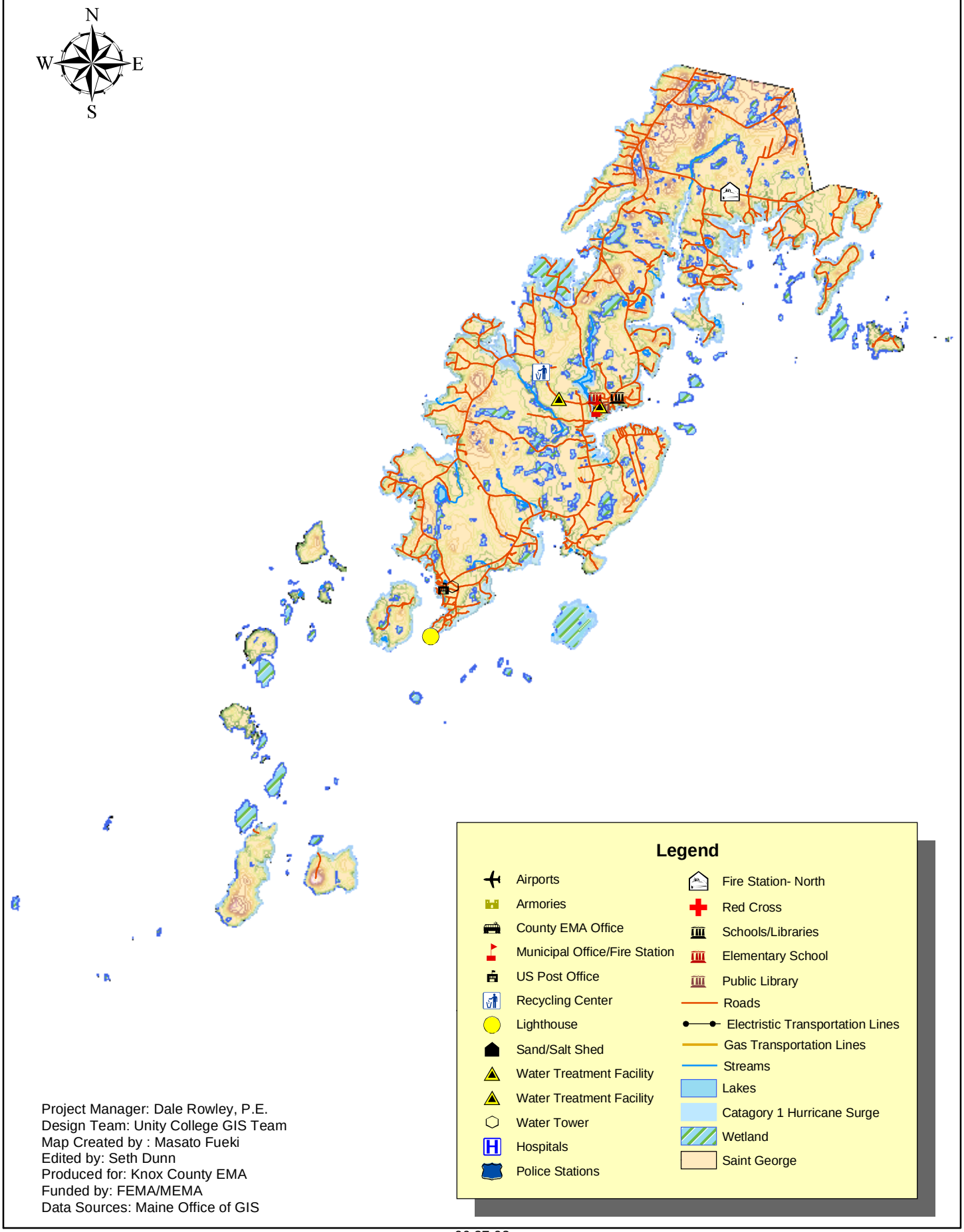
**Legend**

- Airports
- Armories
- County EMA Office
- US Post Office
- Municipal Office
- Penobscot Bay YMCA
- Historical Opera House
- Public Works Garage
- Sewer Treatment Plant
- Sewer Pump Station
- Water Pump Station
- Water Pump Station
- Police Stations
- Fire Station
- Fire Station- West
- Red Cross
- Hospital
- Rescue/Ambulance Services
- Schools/Libraries
- Public Library
- Rockport Elementary School
- Camden Hills High School
- Harbor School
- Montisorri School
- Riley School
- Ashwood School
- Bridges
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Rockport

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.27.03

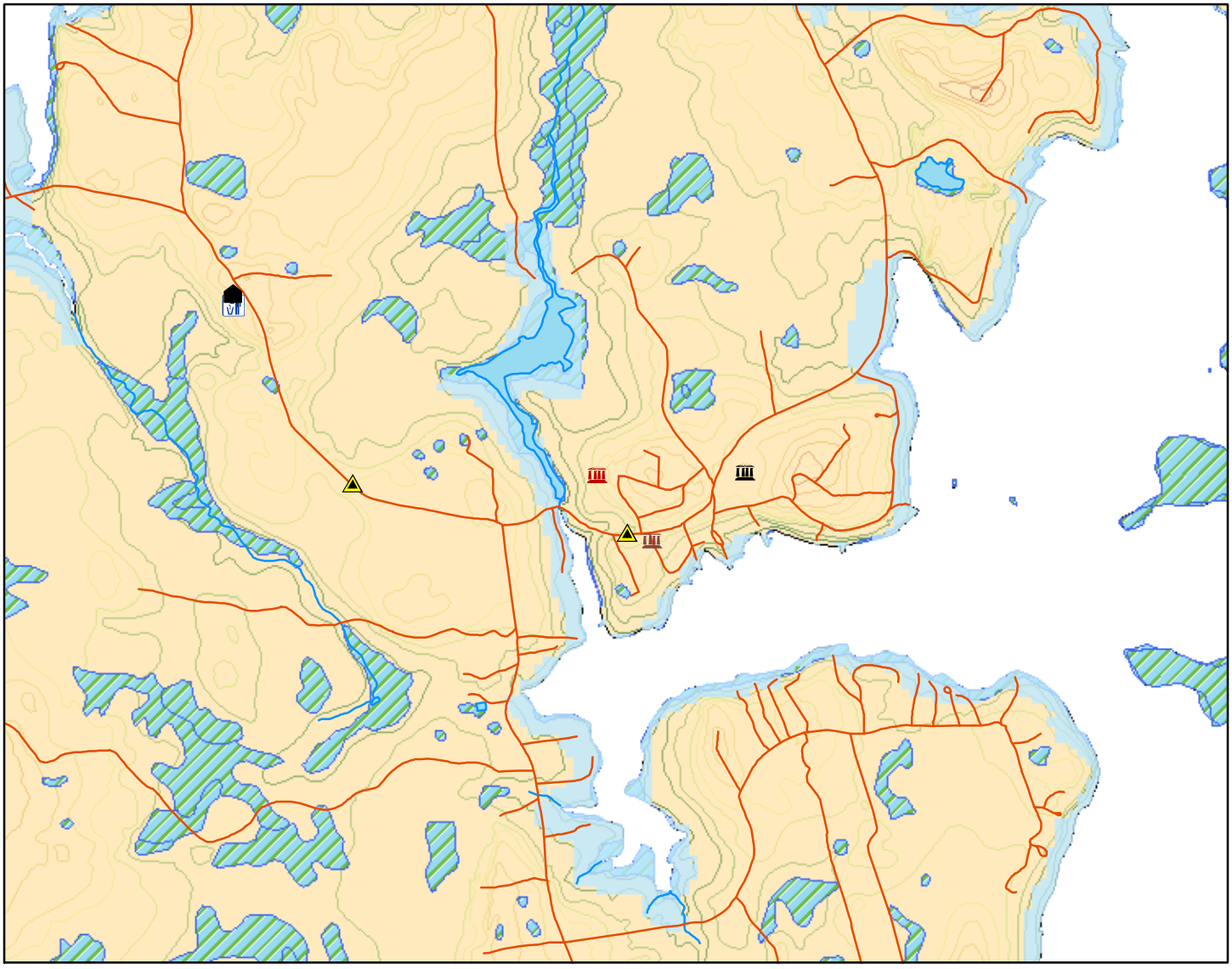
# Knox County Hazard Mitigation Plan
# Town of Saint George Base Map




Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.27.03

# Knox County Hazard Mitigation Plan
# Town of Saint George
# Detail Map



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**Legend**

- Airports
- Armories
- County EMA Office
- Municipal Office/Fire Station
- US Post Office
- Lighthouse
- Sand/Salt Shed
- Recycling Center
- Water Tower
- Water Treatment Facility
- Water Treatment Facility
- Police Stations
- Fire Station- North
- Hospitals
- Red Cross
- Schools/Libraries
- Elementary School
- Public Library
- Roads
- Electristic Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Saint George

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.27.03

# Knox County Hazard Mitigation Plan
# Town of South Thomaston Base Map

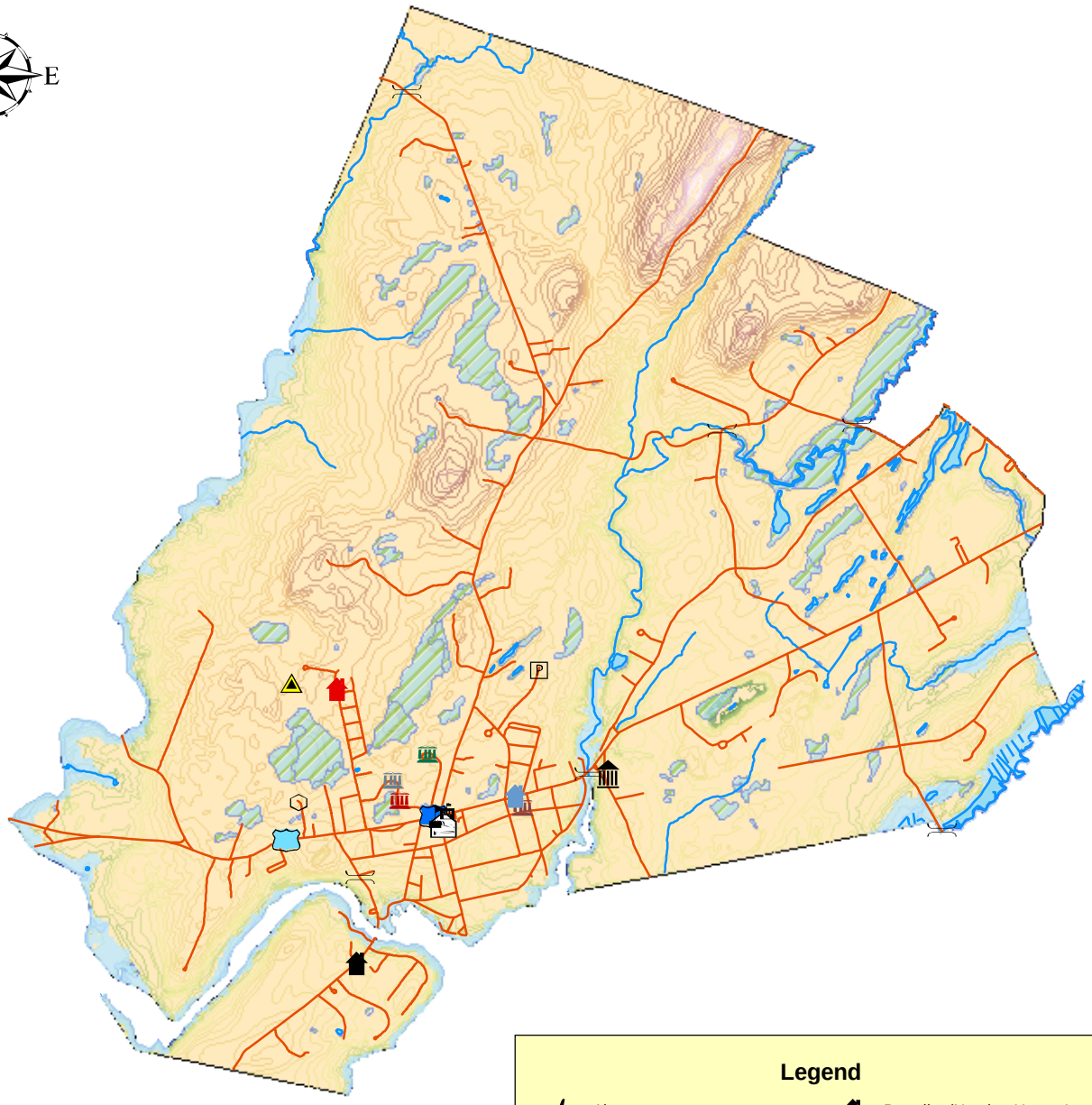

**Legend**

- Airports
- Armories
- County EMA Office
- Municipal Office/Fire Station
- US Post Office
- Sand/Salt Shed
- Hospitals
- Police Stations
- Red Cross
- Elementary School
- Public Library
- Bridges
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- South Thomaston

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.27.03

# Knox County Hazard Mitigation Plan
# Town of Thomaston Base Map

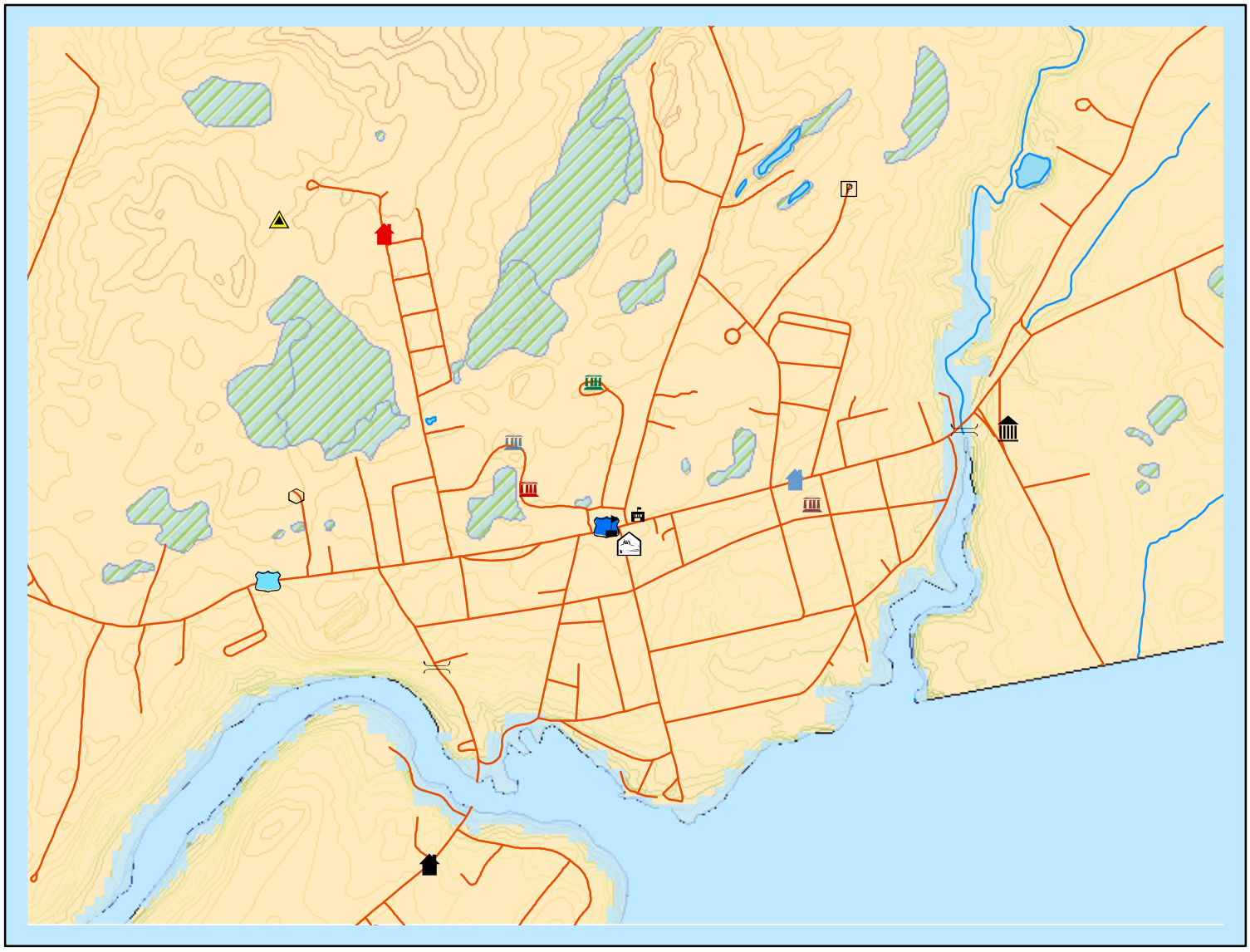



**Legend**

- Airports
- Armories
- Bridges
- County EMA Office
- Municipal Office
- US Post Office
- Henry Knox Mansion
- Public Works Garage
- Water Tower
- Waste Water Treatment Facility
- Hospitals
- Fire Stations
- Thomaston Police Station
- State Police Barracks
- Red Cross
- Boarding/Nursing Home 1
- Boarding/Nursing Home 2
- Boarding/Nursing Home 3
- Thomaston Grammer School
- Lura Libby Elementary School
- Georges Valley High School
- Public Library
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Thomaston

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

# Knox County Hazard Mitigation Plan
# Town of Thomaston
# Detail Map



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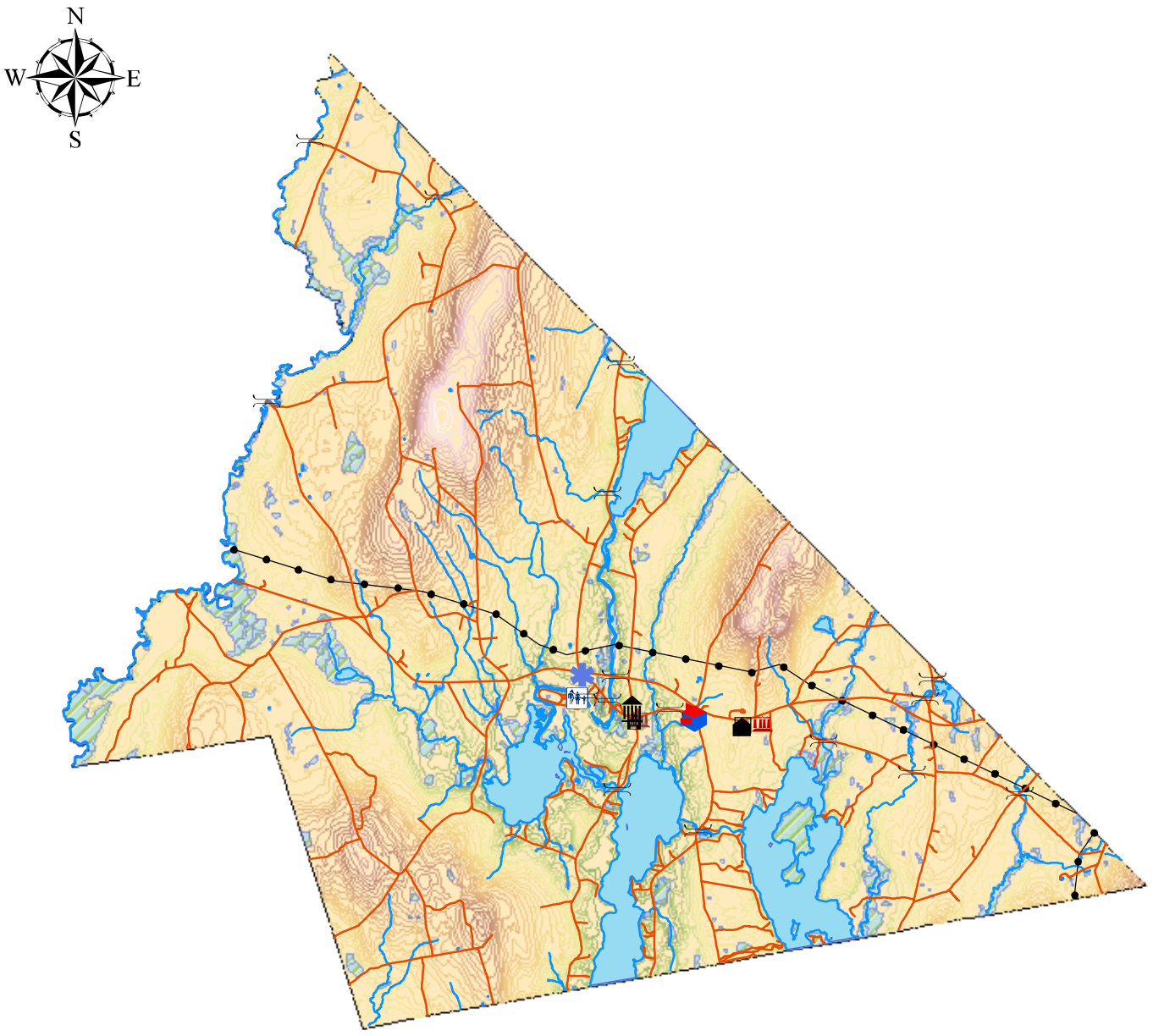
**Legend**

- Airports
- Armories
- Bridges
- County EMA Office
- Municipal Office
- US Post Office
- Public Works Garage
- Water Tower
- Waste Water Treatment Facility
- Henry Knox Mansion
- Boarding/Nursing Home 1
- Boarding/Nursing Home 2
- Boarding/Nursing Home 3
- Hospitals
- Fire Stations
- Thomaston Police Station
- State Police Barracks
- Red Cross
- Thomaston Grammer School
- Georges Valley High School
- Lura Libby Elementary School
- Public Library
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Thomaston

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.30.03

# Knox County Hazard Mitigation Plan
# Town of Union Base Map

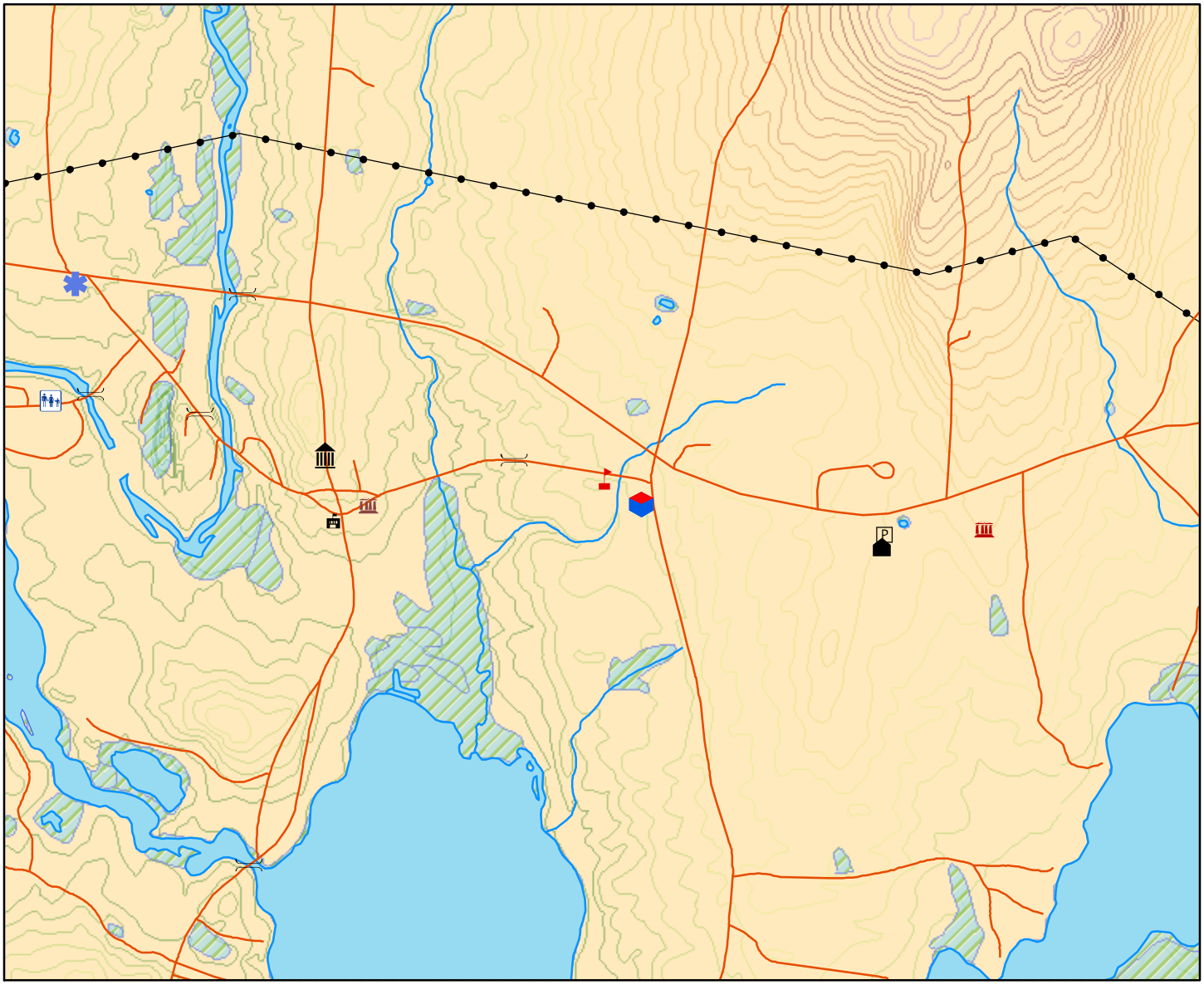



**Legend**

- Airports
- Armories
- Bridges
- County EMA Office
- Municipal Office/Fire Station
- US Post Office
- Union Community Center
- Union Fair Grounds
- Old Town House
- Public Works Garage
- Sand/Salt Shed
- Fire Stations
- Rescue/Ambulance Services
- Hospitals
- Police Stations
- Red Cross
- Union Elementary & D.R. Gaul Middle School
- Vose Public Library
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Wetland
- Union

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

# Knox County Hazard Mitigation Plan
# Town of Union
# Detail Map



N
W E
S

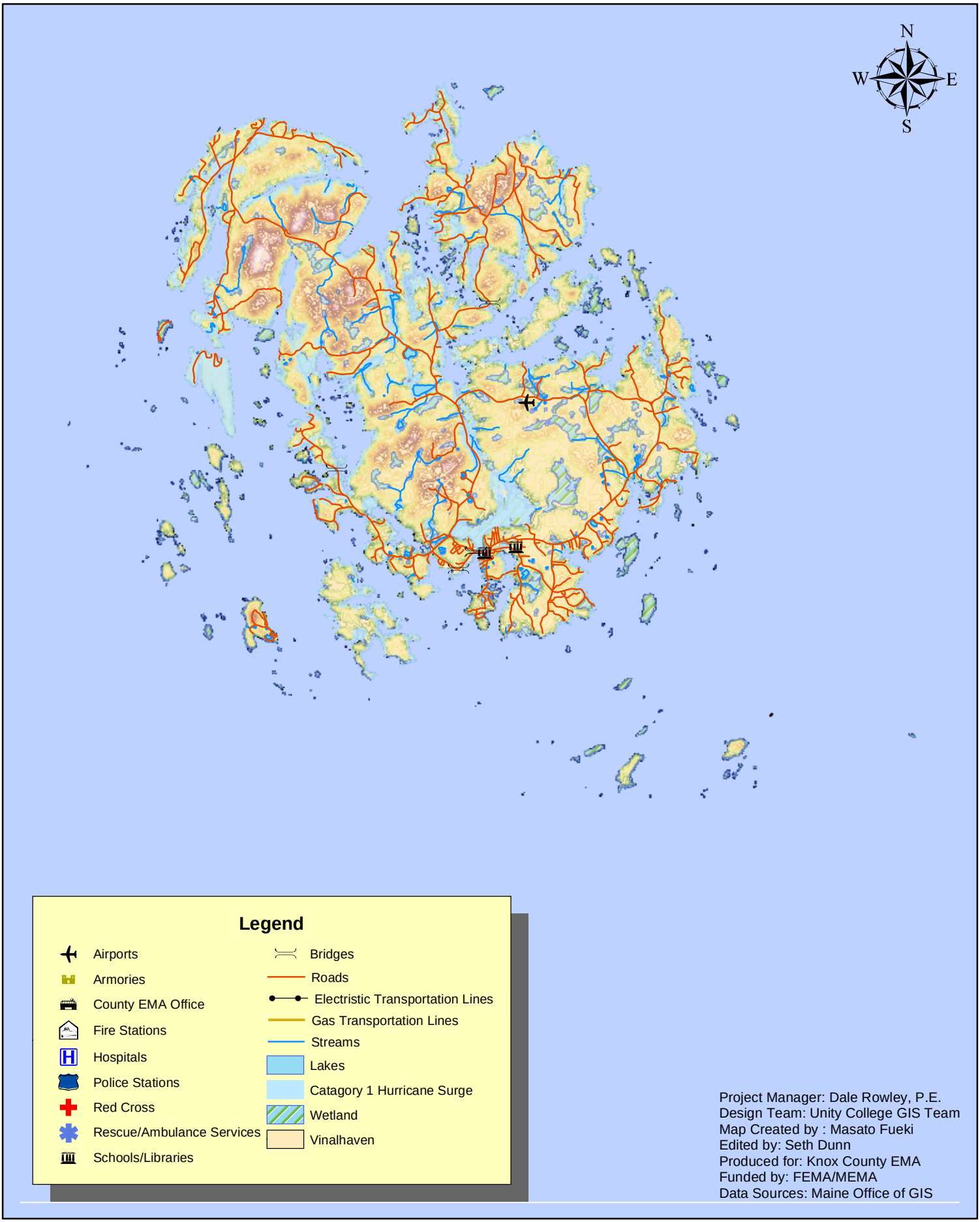
**Legend**

- Airports
- Armories
- Bridges
- County EMA Office
- Municipal Office/Fire Station
- US Post Office
- Union Community Center
- Union Fair Grounds
- Old Town House
- Public Works Garage
- Sand/Salt Shed
- Hospitals
- Rescue/Ambulance Services
- Police Stations
- Red Cross
- Rescue
- Union Elementary & D.R. Gaul Middle School
- Vose Public Library
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Wetland
- Union

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

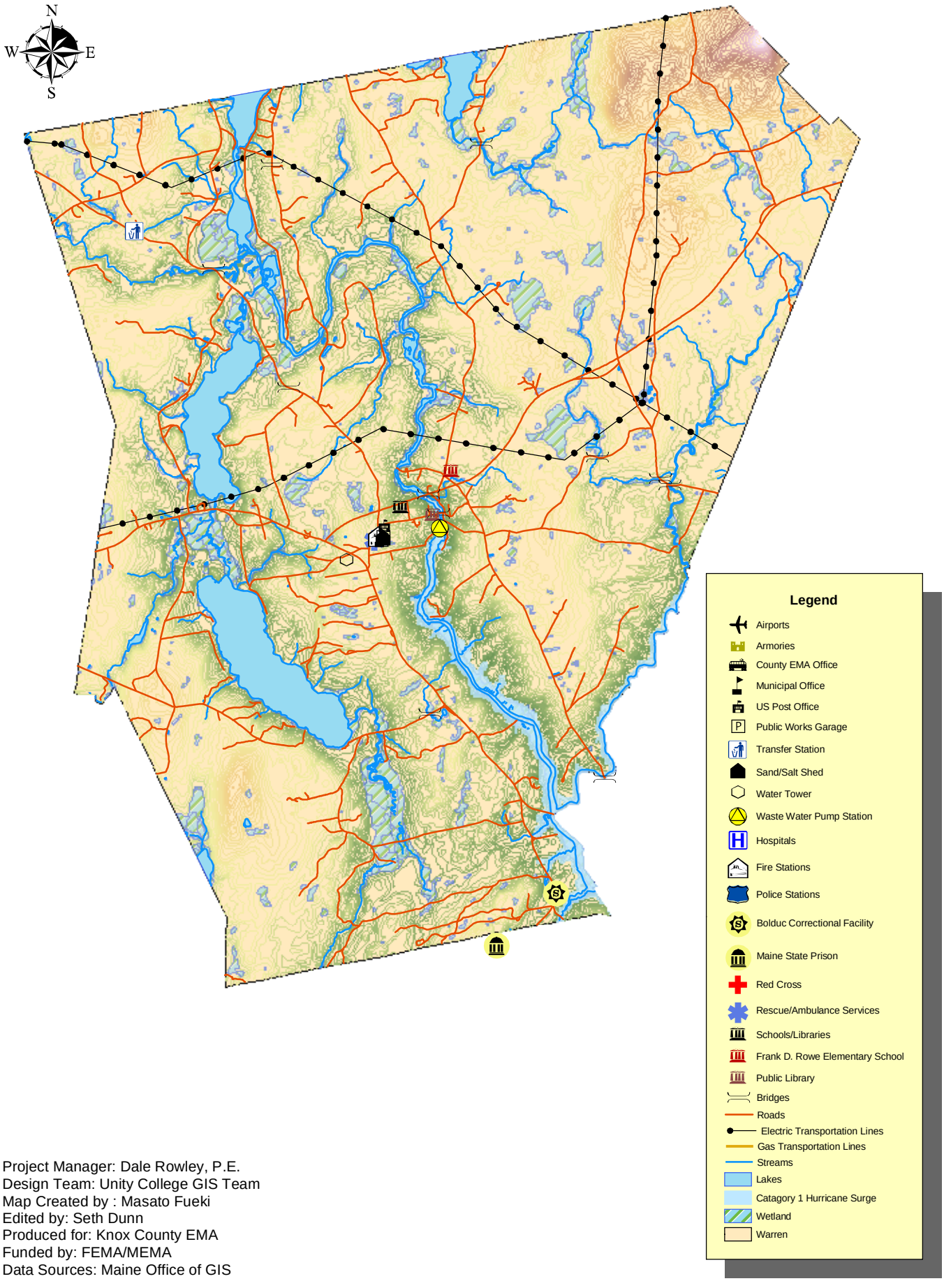
06.30.03

# Knox County Hazard Mitigation Plan
# Town of Vinalhaven Base Map




06.30.03

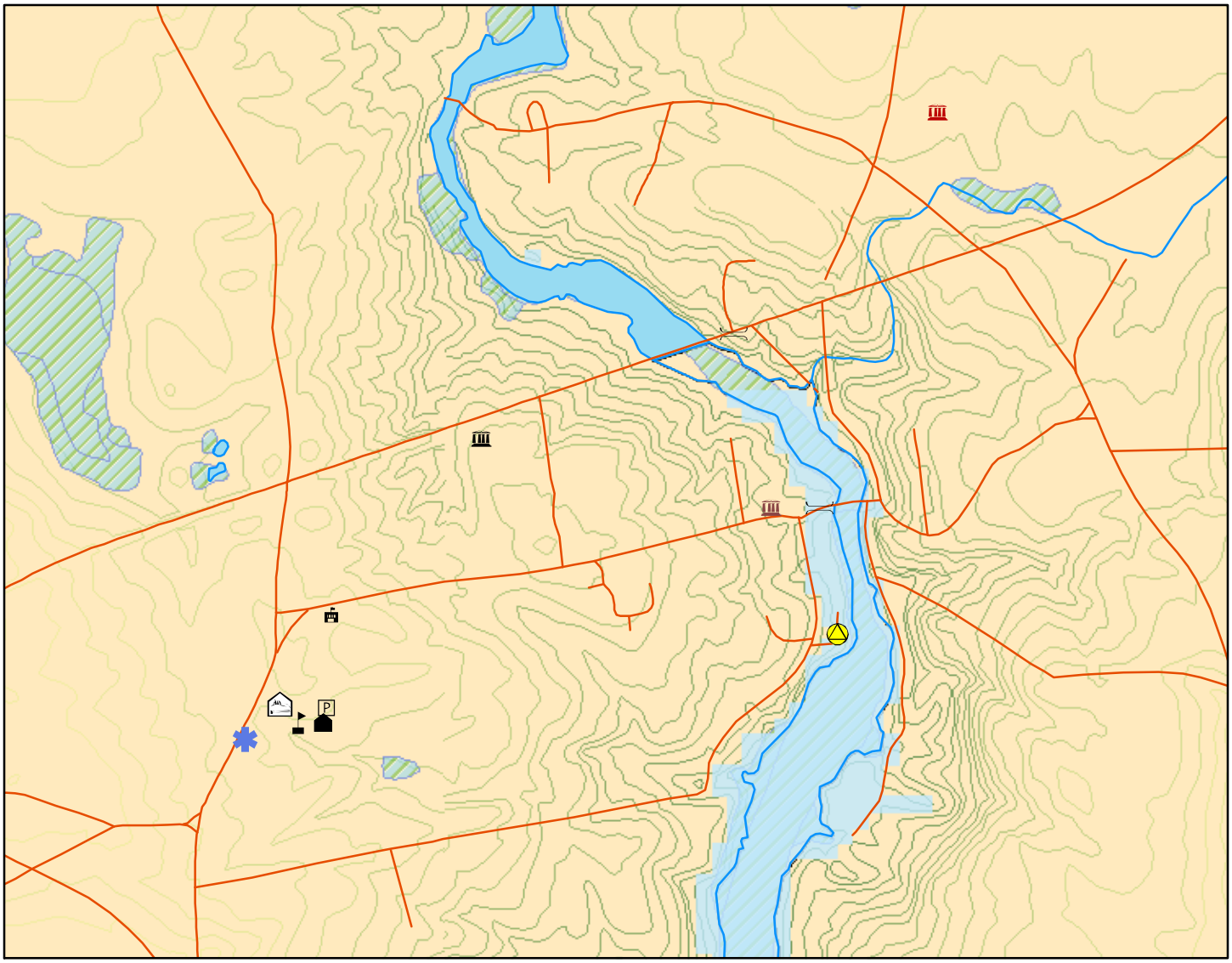
# Knox County Hazard Mitigation Plan
# Town of Warren Base Map




Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masato Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.30.03

# Knox County Hazard Mitigation Plan
# Town of Warren
# Detail Map



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**Legend**

- Airports
- Armories
- County EMA Office
- Municipal Office
- US Post Office
- Public Works Garage
- Sand/Salt Shed
- Transfer Station
- Water Tower
- Waste Water Pump Station
- Hospitals
- Fire Stations
- Police Stations
- Bolduc Correctional Facility
- Maine State Prison
- Red Cross
- Rescue/Ambulance Services
- Schools/Libraries
- Frank D. Rowe Elementary School
- Public Library
- Bridges
- Roads
- Electric Transportation Lines
- Gas Transportation Lines
- Streams
- Lakes
- Catagory 1 Hurricane Surge
- Wetland
- Warren

Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
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Edited by: Seth Dunn
Produced for: Knox County EMA
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Data Sources: Maine Office of GIS

# Knox County Hazard Mitigation Plan
# Town of Washington Base Map


Project Manager: Dale Rowley, P.E.
Design Team: Unity College GIS Team
Map Created by : Masto Fueki
Edited by: Seth Dunn
Produced for: Knox County EMA
Funded by: FEMA/MEMA
Data Sources: Maine Office of GIS

06.30.03

**ASSESSING VULNERABILITY: IDENTIFYING ASSETS**

| | |
|---|---|
| **Requirement §201.6(c)(2) (ii)(A):** | **[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of: The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas** |

The Hazard Mitigation Plan identified critical facilities located within the County and the hazards to which these facilities are susceptible. A critical facility is defined as a facility in either the public or private sector that provides essential products and services to the general public, is otherwise necessary to preserve the welfare and quality of life in the County, or fulfills important public safety, emergency response, and/or disaster recovery functions.

The critical facilities identified in Knox County are municipal offices; fire and police stations; post offices; town garages and sand/salt sheds; hospitals and clinics; electric and communication utilities; water and wastewater treatment facilities; hazardous material sites; and schools.

**Existing Critical Facilities**:

The Knox County Emergency Management Agency used existing Maine GIS map data and a handheld GPS data collector to map and locate the county's critical facilities and determine which are most likely to be affected by hazards. The three hazards most likely to impact the County are severe storm events (summer and winter), wildland fires, and flooding. The analysis revealed the following:

Severe Winter and Summer Storm Hazard: A "Northeaster", blizzard, ice storm or severe coastal storm of the severity that occurs at least once every 3-5 years would have an impact on all roads in the County and on all overhead electrical power and telephone lines. Roads may be covered in snow, washed out, or blocked with tree debris. Utility lines and poles will be felled. No critical structures were identified as in danger from a severe winter or summer storm. A coastal storm could cause general erosion to beach areas and wind damage to coastal buildings.

Wildland Fire Hazard: Forest fires would have an tremendous impact on the large number of homes located in the wildland-urban interface. We estimated that over 6,000 homes or 28% of the homes in Knox County are located in the Wildland-Urban Interface.

Flooding Hazard: No critical public facilities in Knox County were identified as being located in the 100-year flood areas. The most likely flooding will come from coastal flooding occurring during a severe coastal storm or a Category 1 Hurricane. A major coastal storm could impact the downtown road ways in Camden, Friendship, Owls Head, Rockland, Rockport, Thomaston, and Vinalhaven, residential drives in Camden, Cushing, Friendship, Owls Head, Rockland, Rockport, St. George, South Thomaston, and Thomaston, and on the island communities of Isle Au Haut, Martinicus Isle Plantation, North Haven and Vinalhaven.

The following chart identifies the type and number of critical facilities in each town in Knox County. Each of these facilities were GPSed and located on the GIS maps included in this section.

# KNOX COUNTY HAZARD MITIGATION PLAN

## County Asset Inventory by Municipality

| Town | Municipal Office | Fire Station | Police Station | Public Works | Water Treatment | Waste Water Treatment | Library | Schools | Shelters | Hospital /Clinic | Nursing Home | Airport /Seaport | Dams | HazMat Facilities | Pipelines | Bridges | Historical Landmarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appleton | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 4 | 0 |
| Camden | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 3 | 0 | 0 | 4 | 0 | 6 | 0 | 0 | 6 | 1 |
| Cushing | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Friendship | 2 | 1 | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Hope | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Matinicus Plt | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| North Haven | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 4 |
| Owl's Head | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 |
| Rockland | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 7 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rockport | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 6 | 0 | 2 | 0 | 2 | 1 | 2 | 0 | 1 | 0 |
| St George | 1 | 3 | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 |
| S. Thomaston | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| Thomaston | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| Union | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 6 | 1 |
| Vinalhaven | 1 | 1 | 1 | 1 | 3 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| Warren | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 | 0 |
| Washington | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 2 |
| Total | 18 | 20 | 5 | 15 | 9 | 6 | 16 | 36 | 8 | 6 | 18 | 9 | 12 | 4 | 2 | 27 | 13 |

In addition to critical facilities, Knox County contains at risk populations that should be factored into the vulnerability assessment. These include a relatively large population of elderly residents who live alone in very rural areas and who have limited mobility.

An analysis of the local municipal comprehensive plans and general growth patterns for the Knox County communities indicate that there will be a slight but constant increase (5-10%) in residents expected over the next 10 years.

The majority of the residential development and population increase for Knox County in the last 10 years has occurred in the coastal communities. Commercial growth in the past 10 years has been primarily located on the US Route 1 transportation corridor in the City of Rockland, and towns of Camden, Rockport, Thomaston, and Warren. This trend is expected to continue.

**Future Critical Facilities**:

Assessing where future development will occur in the towns in Knox County is difficult due to a lack of municipal data, policies and programs. Most of the Knox County towns are very small and rural and do not have planning departments, building codes or even a full time code enforcement officer. There is very little commercial, industrial and public construction completed in these communities. There is some residential construction, however, there is very little controlling guidance on single-family home construction in the State of Maine at any level of government. Floodplain ordinances and septic system designs are about the only controlling guidance.

Severe Winter Storm Hazard: It is very unlikely that a severe winter storm will have any impact on future structures. This hazard primarily impacts local roads and overhead utility lines.

Wildland Fire Hazard: Forest fires in Knox County towns primarily threaten residential structures in the wildland-urban interface. In all Knox County communities, homes are allowed to be built anywhere, in any land use zone. Some communities may decide to provide wildland fire protection information to new residents who wish to built new homes at the time they are issued a land use permit.

Flooding Hazard: The majority of damages from flooding in Knox County is to roads, not structures. However, most towns do have floodplain ordinances that provide some control over development in flood zones. Those towns that do not have flood zone ordinances, do not have any special flood hazard areas that could ever flood structures – they are primarily streams that could potentially overtop local roads (most old gravel roads with insufficient storm drainage).

## ASSESSING VULNERABILITY: ESTIMATING POTENTIAL LOSSES

| | |
|---|---|
| **Requirement §201.6(c)(2) (ii)(B):** | **The plan should describe vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate…** |

The Knox County Emergency Management Agency and Hazard Mitigation Planning Team, with assistance from Unity College in Maine used GIS modeling, GPS data collection, field inspections, and historical data to estimate the potential dollar losses if the County were to experience severe winter and summer storms, flooding, and wildfires, the most likely hazards to occur in the County. The vulnerable structures and facilities were identified earlier in the planning process. See the County and Municipal Base Maps to locate the Facilities impacted by the Hazard Areas.

The Knox County Hazard Mitigation Planning Team estimated the potential losses from Severe Winter and Summer Storms, Flooding and Wildfires. The results are listed on the following pages:

**Potential Severe Winter and Summer Storm losses**:

The primary damage losses that are expected in Knox County during a "Northeaster", blizzard, ice storm or coastal storm would be to overhead utility lines and local roads. In calculating the damage costs, the Planning Team assumed that all local roads would be covered in snow or ice or blocked with tree and utility line debris. The Team used a figure of $500/mile for road debris clearance or snow removal. The Team also assumed, as a worst case scenario, the total loss of all utility lines and poles from a major winter disaster. The following cost figures were supplied by Central Maine Power Company and Northland Telephone Company:

1. Electrical Power Lines and Utility Poles
   a. 22,000V Lines = $32,000/mile to replace
   b. 34,500V Lines = $300,000/mile to replace
   c. 46,000V Lines = $500,000/mile to replace
   d. 115,00V Lines = $700,000/mile to replace
   e. 345,000V Lines = $1,300,000/mile to replace
2. Telephone Lines = $2,000/mile to replace

No critical structures were identified as in danger from a severe storm in Knox County.

| Municipality | Critical Facility | Function Lost | Quantity (Miles) | Damage Cost |
|---|---|---|---|---|
| Appleton | Electrical Power Lines | Electricity | 47.13 | $1,508,160 |
| | Telephone Lines | Communications | 47.13 | $94,260 |
| | Paved Road Surfaces | Transportation | 29.36 | $14,680 |
| | Gravel Road Surfaces | Transportation | 17.77 | $8,885 |
| Camden | Electrical Power Lines | Electricity | 60 | $1,920,000 |
| | Telephone Lines | Communications | 60 | $120,000 |
| | Paved Road Surfaces | Transportation | 60 | 30,000 |
| | Gravel Road Surfaces | Transportation | 0 | $0 |
| Cushing | Electrical Power Lines | Electricity | 32.25 | $1,032,000 |
| | Telephone Lines | Communications | 32.25 | $64,500 |
| | Paved Road Surfaces | Transportation | 25 | $12,500 |
| | Gravel Road Surfaces | Transportation | 7.25 | $3,625 |
| Friendship | Electrical Power Lines | Electricity | 20.82 | $666,240 |
| | Telephone Lines | Communications | 20.82 | $42,640 |
| | Paved Road Surfaces | Transportation | 20 | $10,000 |
| | Gravel Road Surfaces | Transportation | 0.82 | $410 |
| Hope | Electrical Power Lines | Electricity | 39 | $1,248,000 |
| | Telephone Lines | Communications | 34.7 | $69,400 |
| | Paved Road Surfaces | Transportation | 31.3 | $15,650 |
| | Gravel Road Surfaces | Transportation | 3.4 | $1,700 |

| Municipality | Critical Facility | Function Lost | Quantity (Miles) | Damage Cost |
|---|---|---|---|---|
| Isle Au Haut | Electrical Power Lines | Electricity | 9.04 | $289,280 |
| | Telephone Lines | Communications | 9.04 | $18,080 |
| | Paved Road Surfaces | Transportation | 9.04 | $4,520 |
| | Gravel Road Surfaces | Transportation | 0 | $0 |
| Matinicus Isle Pl | Electrical Power Lines | Electricity | 4.31 | $137,920 |
| | Telephone Lines | Communications | 4.31 | $8,620 |
| | Paved Road Surfaces | Transportation | 0 | $0 |
| | Gravel Road Surfaces | Transportation | 6 | $3,000 |
| North Haven | Electrical Power Lines | Electricity | 25.9 | $828,800 |
| | Telephone Lines | Communications | 25.9 | $51,800 |
| | Paved Road Surfaces | Transportation | 22.9 | $11,450 |
| | Gravel Road Surfaces | Transportation | 3 | $1,500 |
| Owl's Head | Electrical Power Lines | Electricity | 25.5 | $816,000 |
| | Telephone Lines | Communications | 25.5 | $51,000 |
| | Paved Road Surfaces | Transportation | 13.5 | $6,750 |
| | Gravel Road Surfaces | Transportation | 12 | $6,000 |
| Rockland | Electrical Power Lines | Electricity | 58.28 | $1,864,960 |
| | Telephone Lines | Communications | 58.28 | $116,560 |
| | Paved Road Surfaces | Transportation | 57.28 | $28,640 |
| | Gravel Road Surfaces | Transportation | 1 | $500 |
| Rockport | Electrical Power Lines | Electricity | 73.29 | $2,345,280 |
| | Telephone Lines | Communications | 71.89 | $143,780 |
| | Paved Road Surfaces | Transportation | 66.44 | $33,220 |
| | Gravel Road Surfaces | Transportation | 5.45 | $2,725 |
| St. George | Electrical Power Lines | Electricity | 42.71 | $1,366,720 |
| | Telephone Lines | Communications | 42.71 | $85,420 |
| | Paved Road Surfaces | Transportation | 40.21 | $20,105 |
| | Gravel Road Surfaces | Transportation | 2.5 | $1,250 |
| South Thomaston | Electrical Power Lines | Electricity | 20.67 | $661,440 |
| | Telephone Lines | Communications | 20.67 | $41,340 |
| | Paved Road Surfaces | Transportation | 20.67 | $10,335 |
| | Gravel Road Surfaces | Transportation | 0 | $0 |

| Municipality | Critical Facility | Function Lost | Quantity (Miles) | Damage Cost |
|---|---|---|---|---|
| Thomaston | Electrical Power Lines | Electricity | 28.95 | $926,400 |
| | Telephone Lines | Communications | 28.95 | $57,900 |
| | Paved Road Surfaces | Transportation | 28.95 | $14,475 |
| | Gravel Road Surfaces | Transportation | 0 | $0 |
| Union | Electrical Power Lines | Electricity | 70.79 | $2,119,360 |
| | Telephone Lines | Communications | 62.29 | $124,580 |
| | Paved Road Surfaces | Transportation | 45.79 | $22,895 |
| | Gravel Road Surfaces | Transportation | 16.5 | $8,250 |
| Vinalhaven | Electrical Power Lines | Electricity | 41.34 | $1,322,880 |
| | Telephone Lines | Communications | 41.34 | $82,680 |
| | Paved Road Surfaces | Transportation | 25.54 | $12,770 |
| | Gravel Road Surfaces | Transportation | 15.8 | $7,900 |
| Warren | Electrical Power Lines | Electricity | 71.09 | $2,274,880 |
| | Telephone Lines | Communications | 71.09 | $142,180 |
| | Paved Road Surfaces | Transportation | 69.09 | $34,545 |
| | Gravel Road Surfaces | Transportation | 2 | $1,000 |
| Washington | Electrical Power Lines | Electricity | 70.97 | $2,271,040 |
| | Telephone Lines | Communications | 70.97 | $141,940 |
| | Paved Road Surfaces | Transportation | 45.95 | $22,975 |
| | Gravel Road Surfaces | Transportation | 25.02 | $12,510 |
| **Total County** | Electrical Power Lines | Electricity | 742.04 | $23,602,360 |
| | Telephone Lines | Communications | 727.84 | $1,455,680 |
| | Paved Road Surfaces | Transportation | 615.33 | $305,510 |
| | Gravel Road Surfaces | Transportation | 112.51 | $59,510 |
| Grand Total | | | | $25,422,805 |

**Potential flood losses**:

The primary damage losses that are expected in Knox County during any flood event would be damage to local roads. In calculating the damage costs, the Planning Team assumed all roads that were either in the 100 year flood zone or had experienced flooding in the past would be effected. The Team used a figure of $250,000/mile for rebuilding paved roads and $130,000/mile for rebuilding gravel roads. The Team also assumed that any major structure or critical facility located in the 100 year flood zone would be effected. The following cost figures were supplied by Thorndike Engineering, Inc.

| Municipality | Critical Facility | Function Lost | Amt of Damage | Damage Cost |
|---|---|---|---|---|
| Appleton<br>$242,000 | West Appleton Rd<br>Collingston Rd<br>SR 105<br>Fishtown Road<br>Appleton Ridge Road<br>East Appleton Road | Transportation | 1,700 LF<br>1,000 LF<br>800 LF<br>200 LF<br>1,200 LF<br>300 LF | $80,500<br>$47,500<br>$38,000<br>$5,000<br>$57,000<br>$14,000 |
| Camden<br>$128,500 | Sherman Point Rd<br>High Street<br>Barnestown Rd<br>Washington St | Transportation | 800 LF<br>200 LF<br>800 LF<br>900 LF | $38,000<br>$9,500<br>$38,000<br>43,000 |
| Cushing<br>$71,500 | River Road<br>Cross Road<br>Cushing Road | Transportation | 400 LF<br>900 LF<br>200 LF | $19,000<br>$43,000<br>$9,500 |
| Friendship<br>$114,000 | Martin Point Rd<br>Davis Point Loop<br>Bradford Point Rd<br>Waldoboro Rd<br>Cushing Road | Transportation | 1,100 LF<br>400 LF<br>300 LF<br>100 LF<br>500 LF | $52,000<br>$19,000<br>$14,000<br>$5,000<br>$24,000 |
| Hope | None | None | None | $0 |
| Isle Au Haut | None | None | None | $0 |
| Matinicus Isle Pl | None | None | None | $0 |
| North Haven<br>$71,000 | North Shore Road<br>South Shore Road<br>Crabtree Point Road | Transportation | 400 LF<br>700 LF<br>400 LF | $19,000<br>$33,000<br>$19,000 |
| Owl's Head<br>$403,000 | Garth Gannon Road<br>North Shore Road<br>Bellevue Street<br>Ingraham Drive<br>Ginn Point Rd<br>South Shore Road | Transportation | 600 LF<br>200 LF<br>500 LF<br>200 LF<br>3,000 LF<br>4,000 LF | $28,000<br>$9,500<br>$24,000<br>$9,500<br>$142,000<br>$190,000 |
| Rockland<br>$104,500 | West Meadow Lake Avenue<br>water front streets | Transportation | 200 LF<br>2,000 LF | $9,500<br>$95,000 |

| Municipality | Critical Facility | Function Lost | Amt of Damage | Damage Cost |
|---|---|---|---|---|
| Rockport $279,000 | South Hope Road | Transportation | 700 LF | $33,000 |
| | Mount Pleasant St | | 200 LF | $9,500 |
| | Rockland St | | 1,400 LF | $66,000 |
| | Hope Street | | 100 LF | $5,000 |
| | West Street | | 600 LF | $28,000 |
| | West St Ext | | 1,200 LF | $57,000 |
| | Main Street | | 700 LF | $33,000 |
| | Annis Street | | 300 LF | $14,000 |
| | Park Street | | 200 LF | $9,500 |
| | Meadow Street | | 100 LF | 5,000 |
| | Warrenton Street | | 400 LF | $19,000 |
| St. George $185,500 | Clark Island Road | Transportation | 300 LF | $14,000 |
| | Cline Road | | 100 LF | $5,000 |
| | Drift Inn Road | | 800 LF | $38,000 |
| | Glenmere Road | | 200 LF | $9,500 |
| | Harrington Cove Rd | | 500 LF | $24,000 |
| | Otis Point Road | | 100 LF | $5,000 |
| | Ridge Road | | 500 LF | $24,000 |
| | Port Cylde Road | | 400 LF | $19,000 |
| | Seal Harbor Road | | 300 LF | $14,000 |
| | States Point Road | | 100 LF | $5,000 |
| | Turkey Road | | 300 LF | $14,000 |
| | Walston Road | | 300 LF | $14,000 |
| S. Thomaston $166,000 | Buttermilk Lane | Transportation | 300 LF | $14,000 |
| | Church Street | | 500 LF | $24,000 |
| | Island Road | | 1,400 LF | $66,000 |
| | Westbrook Street | | 1,300 LF | $62,000 |
| Thomaston $76,000 | Beechwood Street | Transportation | 100 LF | $5,000 |
| | Greenhouse Hill Rd | | 100 LF | $5,000 |
| | West Meadow Rd | | 100 LF | $5,000 |
| | Atlantic Highway | | 700 LF | $33,000 |
| | Brooklyn Heights Rd | | 600 LF | $28,000 |
| Union $253,000 | 200 LF of Appleton Road | Transportation | 200 LF | $9,500 |
| | 200 LF of Bump Hill Road | | 200 LF | $9,500 |
| | 200 LF of Buzzell Hill Road | | 200 LF | $9,500 |
| | 200 LF of Cleary Hill Road | | 200 LF | $9,500 |
| | 300 LF of Common Road | | 300 LF | $14,000 |
| | 200 LF of Daniels Road | | 200 LF | $9,500 |
| | 100 LF of Depot Street | | 100 LF | $5,000 |
| | 1,000 LF of Heald Highway | | 1,000 LF | $48,000 |
| | 2,000 LF of Hilt Lane | | 2,000 LF | $95,000 |
| | 300 LF of Miller Road | | 300 LF | $14,000 |
| | 200 LF of Mount Pleasant Rd | | 200 LF | $9,500 |
| | 100 LF of Payson Road | | 100 LF | $5,000 |
| | 100 LF of Quiggle Road | | 100 LF | $5,000 |
| | 100 LF of North Union Road | | 100 LF | $5,000 |
| | 100 LF of South Union Road | | 100 LF | $5,000 |
| | Fairgrounds | Social | 1 Ea | $100,000 |

| Municipality | Critical Facility | Function Lost | Amt of Damage | Damage Cost |
|---|---|---|---|---|
| Vinalhaven $5,186,000 | 1,500 LF of Dyer Island Road | Transportation | 1,500 LF | $37,000 |
| | 1,200 LF of Granite Island Rd | | 1,200 LF | $30,000 |
| | 100 LF of North Haven Road | | 100 LF | $5,000 |
| | 400 LF of Round the Island Rd | | 400 LF | $19,000 |
| | 100 LF of Pequot Road | | 100 LF | $5,000 |
| | Commercial Facilities | Economic | 23 Ea | $1,200,000 |
| | Religious/Non-Profit | Social | 1 Ea | $2,500,000 |
| | Government Facilities | Public Services | 15 Ea | $1,390,000 |
| Warren $532,000 | Middle Road | Transportation | 200 LF | $9,500 |
| | Western Road | | 1,000 LF | $48,000 |
| | Vaughn's Neck Road | | 100 LF | $5,000 |
| | State Route 131 | | 600 LF | $28,000 |
| | State Route 90 | | 1,200 LF | $57,000 |
| | State Route 235 | | 300 LF | $14,000 |
| | State Route 97 | | 200 LF | $9,500 |
| | Rabbit Farm Road | | 100 LF | $5,000 |
| | North Pond Road | | 200 LF | $9,500 |
| | Old Augusta Rd | | 1,600 LF | $76,000 |
| | Watton's Mill Road | | 100 LF | $5,000 |
| | Carroll Road | | 500 LF | $24,000 |
| | Beechwood Street | | 500 LF | $24,000 |
| | US Route 1 | | 900 LF | $42,000 |
| | Martin Road | | 200 LF | $9,500 |
| | Depot Road | | 100 LF | $5,000 |
| | Sandy Shores Rd | | 800 LF | $38,000 |
| | Stahl's Hill Rd | | 900 LF | $42,000 |
| | Union Street | | 200 LF | $9,500 |
| | Main Street | | 500 LF | $24,000 |
| | Davies Road | | 200 LF | $9,500 |
| | Patterson Mill Road | | 800 LF | $38,000 |
| Washington $171,000 | 900 LF of Old County Road | Transportation | 900 LF | $42,000 |
| | 800 LF of Mountain Road | | 800 LF | $38,000 |
| | 200 LF of Youngs Hill Road | | 200 LF | $9,500 |
| | 600 LF of SR 105 | | 600 LF | $28,000 |
| | 200 LF of SR 17 | | 200 LF | $9,500 |
| | 100 LF of SR 156 | | 100 LF | $5,000 |
| | 300 LF of Fitch Road | | 300 LF | $14,000 |
| | 100 LF of Vanner Road | | 100 LF | $5,000 |
| | 100 LF of Calderwood Road | | 100 LF | $5,000 |
| | 100 LF of Sprague Road | | 100 LF | $5,000 |
| | 100 LF of Skidmore Road | | 100 LF | $5,000 |
| | 100 LF of Hopkins Road | | 100 LF | $5,000 |
| **Total County** | Roadway | Transportation | 11.8 mi | $2,893,000 |
| | Fairground | Social | 1 Ea | $100,000 |
| | Public & Commercial Facilities | Services/Econ | 39 Ea | $5,186,000 |

**Potential Wildfire losses**:

The primary damage losses that are expected in Knox County during any wildfire event would be destruction of single-family residential structures. In calculating the damage costs, the Planning Team assumed all homes located in the wildland-urban interface would be destroyed in a worst case wildfire scenario. The Team used the actual total municipal assessment figures for the residential structures in their communities. The following percentages were used to determine an estimated number of homes that could be potential losses. For each community, the "Community Size" value was added to the "Land Cover" and "Number of Fires" values.

| **Community Size** | **Land Cover Value** | **Number of fires in 7 years** |
|---|---|---|
| Very Rural = +25% | Moderate = +25% | Over 30 = +35% |
| Semi-Rural = +10% | Low = +10% | 20-29 = +25% |
| Sub-Urban = +5% | | 10-19 = +15% |
| | | 1-9 = +5% |

| **Municipality** | **Critical Facility** | **Function Lost** | **Amt of Damage** | **Damage Cost** |
|---|---|---|---|---|
| Appleton | Homes (50%) | Shelter | 270 | $9,443,000 |
| Camden | Homes (20%)<br>Commercial<br>Agricultural<br>Religious/Non-Profit<br>Government | Shelter<br>Economic<br>Economic<br>Social<br>Government | 577<br>45<br>5<br>2<br>3 | $53,330,000<br>$29,000,000<br>$1,500,00<br>$1,000,000<br>$1,200,000 |
| Cushing | Homes (35%) | Shelter | 272 | $20,300,000 |
| Friendship | Homes (25%) | Shelter | 212 | $13,963,000 |
| Hope | Homes (35%) | Shelter | 240 | $18,161,000 |
| Isle Au Haut | Homes (40%) | Shelter | 66 | $5,440,000 |
| Matinicus Isle Pl | Homes (40%) | Shelter | 54 | $2,595,000 |
| North Haven | Homes (25%) | Shelter | 122 | $15,087,700 |
| Owl's Head | Homes (25%) | Shelter | 248 | $18,547,000 |
| Rockland | Homes (30%) | Shelter | 1125 | $72,880,000 |
| Rockport | Homes (40%) | Shelter | 671 | $52,625,000 |
| St. George | Homes (25%) | Shelter | 444 | $25,474,000 |
| S. Thomaston | Homes (25%) | Shelter | 201 | $11,700,000 |
| Thomaston | Homes (30%) | Shelter | 460 | $30,054,000 |
| Union | Homes (35%) | Shelter | 240 | $23,679,000 |
| Vinalhaven | Homes (15%) | Shelter | 184 | $18,607,000 |
| Warren | Homes (30%) | Shelter | 460 | $19,339,000 |
| Washington | Homes (25%) | Shelter | 174 | $9,482,000 |
| Total County | | | 6,020 | $453,406,000 |

## ASSESSING VULNERABILITY: ANALYZING DEVELOPMENT TRENDS

| | |
|---|---|
| ***Requirement §201.6(c)(2) (ii)(C):*** | [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions. |

Knox County is located along the mid-coastline of Maine and is largely rural. A majority of the County's land use is designated as Rural and is primarily forestland or farmland. The largest city, Rockland, which has a year-round population of 7,609, is located midway on the coastline in the eastern half of the County. There are no suburbs in Knox County. The land uses within the county generally consist of: Residential, Resource Protection, Agricultural, Industrial, Institutional and Commercial areas.

The State of Maine Legislature enacted the Growth Management Act in 1989 (Title 30-A, Chapter 187, subchapter 2) which requires each community to develop a Municipal Comprehensive Plan. The municipal comprehensive plans allow development to occur in appropriate areas taking into account the environment, physical constraints, location of utility services, similarity to existing development, and proximity to flood zone areas.

The municipalities must review existing conditions and predict future needs in order to develop their own plans, policies, and ordinances. Most municipalities in Knox County have enacted Flood zone, Shoreland Zone, and other land use ordnances. Further breakdown of the land use designations is shown on the following chart.

Severe winter and summer storms will have an impact on all land use areas and zones within the 18 communities in Knox County. This hazard has the primary impact of shutting down transportation and power, which will shut down business, industry, commerce and schools and stop all social and emergency services.

Flooding will have an impact on all land use areas and zones within the 18 communities in Knox County. This hazard has the primary impact of shutting down transportation, since it is primarily the roads that are the object of flooding in the County. This could impact business, industry, commerce and schools and delay many social and emergency services.

The majority of the municipalities (14 of 18) in Knox County have enacted floodplain ordinances to prevent new commercial, industrial, and institutional development within flood zones. Four towns are not members of the NFIP program; these are: Cushing, Hope, Isle Au Haut, and Washington. There are some existing commercial developments within flood zones in the County. These businesses have been in place for many years and are upgraded to meet floodplain ordinances as the structures are renovated or replaced. Additionally, there are a number of homes and seasonal camps that are within the flood zones. Likewise, as these properties are mortgaged, they are required to be upgraded in order to meet the floodplain ordinances.

Wildfires will have an impact on the residential properties located within the Wildland-Urban Interface. Because Knox County is a very densely forested, sparsely populated area, there are a great number of homes that are at risk to destruction by forest fires. Currently, no municipality in Knox County has wildfire restrictions or requirements on residential development.

The Mid Coast Regional Planning Commission has indicated that the residential development pressure surrounding Camden and Rockland is the largest concern with respect to future land use decisions and hazard mitigation planning. The remainder of the County is expected to undergo a slight increase in residential development pressure to due the success of MBNA.

The Land Use Types and Growth Areas that have been designated in Knox County are:

| Municipality | Land Use Types or Districts | Growth Areas |
|---|---|---|
| Appleton | Resource Protection, Stream Protection, and Limited Residential | None |
| Camden | Natural Resource Protection, Rural, Rural Recreation, Coastal Residential, Village Extension, Traditional Village, Downtown Business, Highway Business, Transitional Business, Neighborhood Service, Harbor Business, River Business, Transitional River Business, and Industrial | Village Extension, Highway Business, River Business, and Industrial |
| Cushing | Resource Protection | None |
| Friendship | Rural Residential, Commercial Fisheries & Maritime, Sand & Gravel Aquifer, Shoreland Protection, Stream Protection, Wellhead Protection, and Wetlands | Commercial Fisheries & Maritime |
| Hope | Limited Residential, Resource Protection, Stream Protection and Residential | Residential |
| Isle Au Haut | Resource Protection, Stream Protection and Residential | None |
| Matinicus Isle Pl | Resource Protection, Stream Protection and Residential | None |
| North Haven | Village, Rural, Shoreland, Commercial Shoreland, Commercial, Resource Protection, Stream Protection | Commercial |
| Owl's Head | Commercial, Commercial Fisheries & Maritime, Resource Protection, and Rural Residential | Commercial |
| Rockland | Commercial Growth, Industrial Growth, High Residential Density Growth, Medium Residential Density Growth, Low Residential Density Growth, Recreational Public, Resource Protection, Waterfront | Commercial Growth, Industrial Growth, High Residential Density Growth, Medium Residential Density Growth, Low Residential Density Growth |
| Rockport | Village, Rural Residential, Coastal Residential, Mixed Business/Residential, Rural Conservation, Resort, Suburban Residential, Downtown, Watershed, Industrial | Industrial |
| St. George | Resource Protection, Marine Residential, Limited Commercial, Commercial Fisheries, Stream Protection, Recreation | Limited Commercial, Commercial Fisheries |
| S. Thomaston | Island, Village, Rural, Village | None |

| Municipality | Land Use Types or Districts | Growth Areas |
|---|---|---|
| Thomaston | Transitional Residential, Urban Residential, Rural Residential, Rural Residential & Farming, Commercial, Resource Protection, Shoreland Commercial, and Industrial | Commercial and Industrial |
| Union | Farm & Agricultural, Village, Commercial, and Industrial | Commercial and Industrial |
| Vinalhaven | Resource Protection, Stream Protection and Residential | None |
| Warren | Residential, Rural, Resource Protection, Limited Commercial/Residential, Village, Industrial, Residential/Recreation | Residential & Industrial |
| Washington | Conservation, Farm & Forest, Rural, Rural/Commercial, Village, Shoreland, and Wetland | Rural/Commercial |

## MULTI-JURISDICTIONAL RISK ASSESSMENT

| | |
|---|---|
| Requirement §201.6(c)(2) (iii): | For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area. |

Knox County is a small Maine county of 39,618 people living in **365** square miles located along the mid-coast of Maine. There are 18 municipalities within the County. All eighteen municipalities contributed to the risk assessment analyses performed for the Knox County Hazard Mitigation Plan.

The Planning Team identified severe summer and winter storms as the most significant risk to the entire County, followed in severity by generalized flooding and then wildfires.

The coastal communities of Camden, Cushing, Friendship, Isle Au Haut, North Haven, Owl's Head, Rockland, Rockport, St. George, South Thomaston, and Vinalhaven are more susceptible to ice storms and coastal storm surges then the inland communities. The ice storm risk is due to the slightly warmer temperatures that these communities experience from the coastal waters. The storm surges also affects the beach areas of these communities, which are highly developed due to the tourist business and attraction of living on the coast.

Although all areas are at risk from forest fires, it is the less densely-populated areas of the inland communities that face extensive acreage losses. This is due to the lack of roadways (accessibility) within the forest land. Additionally, the resources for wildland fire fighting from the inland municipal departments are very limited, due to the small population base.

Although Landslides are not a general hazard to Knox County, the Town of Rockland has had landslides that have endangered traffic on U.S. Route 1. There was an incident on April 16 and 17, 2002 that caused $377,452. This is the only location in Rockland and the rest of the County that has experienced damages from landslides.

## V. MITIGATION STRATEGY

§201.6(c)(3) of the Rule outlines measures that localities must take in developing their mitigation strategies. Specifically, the Local Hazard Mitigation Plan must "include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools."

This entails the development of goals from which specific mitigation actions and projects will be derived. All mitigation actions must be prioritized according to a cost-benefit analysis, with a focus on how effective the actions are expected to be with respect to their cost. For multi-jurisdictional plans, each jurisdiction must show the specific actions they will undertake.

This section includes the following four subsections as follows:

Local Hazard Mitigation Goals

Identification and Analysis of Mitigation Measures

Implementation of Mitigation Measures

Multi-jurisdictional Mitigation Strategy

## LOCAL HAZARD MITIGATION GOALS

| Requirement §201.6(c)(3) (i): | The hazard mitigation strategy shall include: a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards. |
|---|---|
| Definitions | **Goals** are general guidelines that explain what you want to achieve. They are usually long-term and represent global visions, such as "eliminate flood damage." **Objectives** define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific, measurable, and have a defined completion date. Objectives are more specific, such as "adopt a zoning ordinance prohibiting new development in the floodplain." |

The Knox County Hazard Mitigation Planning Team met to review and analyze the County's risk assessment studies. The following goals were determined to have the greatest benefit in hazard reduction in the County. The goals, objectives, and actions for each are as follows:

### SEVERE WINTER & SUMMER STORM EVENTS

In Knox County, the most likely damages caused by a severe winter or summer storm event are the loss of electrical power, from downed power transmission lines, and the blockage of roadways, from tree debris or winter snow or ice. There could be loss of life caused by delayed responses from emergency services, the improper use of backup heat sources, freezing conditions, debris falling on an individual, or from storm-related vehicle accidents. Other types of general damage to personal and real property may be caused by blizzard or hurricane winds. The very presence of a blizzard or coastal storm will shut commerce down, resulting in major losses of income for local businesses. Therefore, the goals and objectives to mitigate the damages from severe winter and summer storms are:

**Goal 1**: **Reduce damage, injury and loss of life in Knox County after a storm event**

Objective 1.1. Lessen the future loss of life and personal injuries resulting from severe storms.

Objective 1.2. Reduce real and personal property damages caused by severe storms.

Objective 1.3. Assure all emergency facilities have temporary backup power capabilities.

Objective 1.4. Assure prompt restoration of critical transportation links.

## FLOODING

In Knox County, the most likely damages caused by flooding are the destruction of roadways caused by washouts and undercutting. It does not appear that there are any critical facilities in the 100 year flood zone, however there are several facilities that are located in the Hurricane Surge Inundation Areas, especially on the islands. Most communities are using the FIRM information to control development in flood zones, however, there has been no use of the Hurricane Inundation Surge Areas to control development. There could be loss of life caused by delayed responses from emergency services and drownings during high water (river and lake) conditions. Flood waters may also contaminate public and private water supplies and damage personal and real property. Flooding may shut down businesses, resulting in major losses of income for local businesses and residents. Therefore, the goals and objectives to mitigate the damages from flooding are:

**Goal 2**: **Reduce damage, injury and loss of life in Knox County caused by flooding**

Objective 2.1. Lessen the future loss of life and personal injuries resulting from flooding.

Objective 2.2. Reduce real and personal property damages caused by flooding.

Objective 2.3. Assure prompt restoration of critical transportation links.

## WILDLAND FIRES

**Goal 3**: **Reduce damage, injury and loss of life in Knox County caused by Wildfires**

In Knox County, the most likely damages caused by a wildland fire event are the loss of life, loss of prime timberland, and the destruction of personal and real property, especially homes. The loss of electrical power is possible, since the majority of high voltage transmission lines pass through heavily wooded areas. The very presence of a wildfire may close commerce, resulting in major losses of income for local businesses. Therefore, the goals and objectives to mitigate the damages from wildland fires are:

Objective 3.1. Lessen the future loss of life and personal injuries resulting from wildfires.

Objective 3.2. Reduce real and personal property destruction from wildfires.

Objective 3.3. Reduce the loss of timber resources caused by forest fires.

## IDENTIFICATION AND ANALYSIS OF MITIGATION MEASURES

| | |
|---|---|
| **Requirement §201.6(c)(3) (ii):** | **The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.** |

Knox County has identified several hazard mitigation measures that would benefit the County and municipalities and were analyzed by the Knox County Hazard Mitigation Planning Team. These measures were identified in the Mitigation Planning Team meetings and during meetings with the public officials representing each municipality. The identified mitigation measures are broken out by the Goals and Objectives for each hazard and analyzed using a decision matrix that follows this list.

**Goal 1**: **Reduce damage, injury and loss of life in Knox County after a severe storm event**

**Objective 1.1.** Lessen the future loss of life and personal injuries resulting from severe storms.

Measure 1.1.1. Educate the public on dangers of severe winter and summer storms.

Measure 1.1.2. Encourage residents without utilities to report to emergency shelters.

Measure 1.1.3. Encourage home owners to keep primary & secondary egress routes cleared.

Measure 1.1.4. Develop procedures and provide training to locate and identify special health need populations.

Measure 1.1.5. Deice slippery roads during or soon after a winter storm event.

**Objective 1.2.** Reduce real and personal property damages caused by severe storms.

Measure 1.2.1. Educate home owners about winter and summer storm preparations.

Measure 1.2.2. Encourage home owners to purchase insurance for severe storm damages.

Measure 1.2.3. Develop plans to handle surges in boat mooring requirements.

**Objective 1.3.** Assure all emergency facilities have temporary backup power capabilities.

Measure 1.3.1. Provide generators at all critical facilities and utilities such as Fire/Police Stations, EMS garages, public works fuelling points, Water & Sewer treatment plants, schools, and shelters.

Measure 1.3.2. Encourage homeowners to have generators, non-electrical heating, or alternate energy sources, such as solar, wind or hydro power.

Measure 1.3.3. Develop/update ordinance to require new public facilities to have a generator.

**Objective 1.4.** Assure prompt restoration of critical transportation links.

Measure 1.4.1. Develop a written municipal road snow and ice removal operations plan that includes a prioritization of roads to be cleared.

Measure 1.4.2. Train and equip a quick-response Road Debris Clearance Team from public works, fire department and/or volunteers.

Measure 1.4.3. Develop mutual aid agreements with local ATV & Snowmobile organizations.

Measure 1.4.4. Update or develop the resources section in the municipal Emergency Operations Plan with heavy equipment that could be used for snow removal.

Measure 1.4.5. Develop alternate-transportation means for emergency responders.

**Goal 2**: **Reduce damage, injury and loss of life in Knox County caused by flooding**

**Objective 2.1.** Lessen the future loss of life and personal injuries resulting from flooding.

Measure 2.1.1. Educate drivers on risks of crossing flooded roadways.

Measure 2.1.2. Develop a “Barricade Plan” to block flooded roads in order to prevent crossing by vehicle operators. Acquire necessary barricade equipment and supplies.

Measure 2.1.3. Educate the public on staying away from flooded river banks.

**Objective 2.2.** Reduce real and personal property damages caused by flooding.

Measure 2.2.1. Encourage home owners to relocate, elevate or retrofit homes in flood zones.

Measure 2.2.2. Implement municipal floodplain ordinances.

**Objective 2.3.** Assure prompt restoration of critical transportation links.

Measure 2.3.1. Perform and develop a Stormwater Analysis and Management Plan.

Measure 2.3.2. Upgrade ditches, culverts and roadway drainage systems.

**Goal 3**: **Reduce damage, injury and loss of life in Knox County caused by Wildfires**

**Objective 3.1.** Lessen the future loss of life and personal injuries resulting from wildfires.

Measure 3.1.1. Develop warning and evacuation plans and systems for fast moving forest fires.

Measure 3.1.2. Train all firefighters in Wildland Fire Fighting Safety.

Measure 3.1.3. Equip all fire departments with sufficient wildfire personal protection equipment.

Measure 3.1.4. Educate the public of dangers of forest fires.

**Objective 3.2.** Reduce real and personal property destruction from wildfires.

Measure 3.2.1. Introduce building codes requiring fire-retardant roofing and siding materials.

Measure 3.2.2. Educate home owners on tactics to protect their homes from wildfires.

Measure 3.2.3. Provide more authority and better training to the municipal Fire Wardens.

Measure 3.2.4. Encourage the construction of Fire Ponds by private land owners.

Measure 3.2.5. Encourage private land owners to cut back tree growth along access drives.

**Objective 3.3.** Reduce the loss of timber resources caused by forest fires.

Measure 3.3.1. Encourage bulk slash reduction through good Forestry BMPs.

Measure 3.3.2. Maintain woods and logging roads for firefighting access.

| | |
|---|---|
| **Requirement: §201.6(c)(3) (iii):** | **The mitigation strategy section shall include an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, ~~implemented, and administered~~ by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.** |

(Note: Implementation and administration will be dealt with in the next section.)

The decision matrix format located on the next page was used by the Knox County Hazard Mitigation Planning Team as a quantified approach using pre-selected criteria. The population numbers, dollar values, and other quantified factors under each rank value were be selected to be appropriate to the size of Knox County, the number of jurisdictions, and the policies of the Planning Team. This matrix was used by comparing the proposed mitigation measure with each of the descriptions for each criteria category, and the "best fit" selected. Then, the sum of the numbers selected under each criterion is totaled to derive the priority rank for the initiative. The higher the resulting number, the higher the priority of the initiative. This matrix was adapted from the Florida Department of Community Affairs' Local Mitigation Strategy Guidebook.

### Description of the priority rank value

| Criteria Category | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|
| Population Benefited | Over 10,000 | 2,500 to 10,000 | 1,000 to 2,500 | 500 to 1,000 | Under 500 |
| Percentage of Jurisdiction Benefited | 76 to 100% | 51 to 75% | 26 to 50% | 6 to 25% | Less than 5% |
| Health and Safety Considerations | Benefit several jurisdictions (over 10,000 people) and/or major portions of County population | Benefit between 2,500 and 10,000 people | Benefit between 1,000 and 2,500 people | Benefit less than 1,000 people | No anticipated benefit |
| Cost Impact of the Initiative (B) | Over $1,000,000 | $100,000 to $1,000,000 | $50,000 to $100,000 | Less than $50,000 | No quantifiable cost impact |
| Estimated Cost of Implementing the Initiative (C) | No quantifiable cost | Less than $50,000 | Between $50,000 and $100,000 | Between $100,000 and $1,000,000 | Over $1,000,000 |
| Benefit to Cost Ratio | More then +4.0 | +3.0 to +3.9 | +2.0 to +2.9 | +1.0 to +1.9 | Less then 1.0 |
| Probability of Community Acceptance | Likely to be endorsed by the entire community | Benefits only those directly affected and not adversely affecting others | Somewhat controversial with special interest groups or small % of community | Strongly opposed by special interest groups or significant % of community | Strongly opposed by most of general population |
| Probability of Funding | Potential funding sources not readily apparent | Only funding source is post-mitigation funds | Funding could be through matching local funds with others | Funding can probably be obtained through local long term budgeting | Funding can probably be obtained through local short term budgeting |
| Feasibility of Implementation | Relatively easy to put in place within a year | Not anticipated to be difficult | Somewhat difficult due to complex requirements | Difficult due to significantly complex requirements | Very difficult due to extremely difficult requirements |
| Consistency with other Plans and Programs | Initiative included in several other plans and programs | Initiative included in two other plans and programs | Initiative included in one other plan or program | Initiative not included in other plan or program | Initiative not consistent with other plans or programs |

# KNOX COUNTY HAZARD MITIGATION PLAN

Table of Mitigation Measure Priorities

**SEVERE WINTER & SUMMER STORMS**

| Measure | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total Pts | Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.1.1. | 3 | 1 | 3 | 2 | 3 | 4 | 0 | 3 | 3 | 4 | 26 | 7 |
| 1.1.2. | 0 | 0 | 1 | 1 | 3 | 1 | 0 | 3 | 3 | 4 | 16 | 9 |
| 1.1.3. | 1 | 0 | 1 | 1 | 3 | 0 | 0 | 3 | 3 | 4 | 16 | 9 |
| 1.1.4. | 3 | 1 | 3 | 3 | 3 | 3 | 4 | 3 | 4 | 2 | 29 | 5 |
| 1.1.5. | 4 | 4 | 4 | 3 | 1 | 0 | 4 | 1 | 3 | 3 | 27 | 6 |
| 1.2.1. | 3 | 1 | 2 | 3 | 3 | 4 | 3 | 3 | 3 | 1 | 26 | 7 |
| 1.2.2. | 0 | 0 | 1 | 1 | 3 | 0 | 1 | 3 | 4 | 1 | 14 | 10 |
| 1.2.3. | 3 | 1 | 3 | 4 | 3 | 4 | 3 | 3 | 2 | 3 | 29 | 5 |
| 1.3.1. | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 34 | 2 |
| 1.3.2. | 4 | 4 | 3 | 4 | 3 | 4 | 2 | 3 | 3 | 2 | 32 | 3 |
| 1.3.3. | 4 | 4 | 3 | 4 | 3 | 4 | 0 | 1 | 0 | 2 | 25 | 8 |
| 1.4.1. | 4 | 4 | 3 | 3 | 3 | 4 | 2 | 0 | 4 | 3 | 30 | 4 |
| 1.4.2. | 4 | 4 | 3 | 3 | 3 | 4 | 2 | 0 | 4 | 3 | 30 | 4 |
| 1.4.3. | 1 | 0 | 1 | 1 | 4 | 4 | 3 | 4 | 4 | 0 | 22 | 8 |
| 1.4.4. | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 38 | 1 |
| 1.4.5. | 2 | 0 | 1 | 1 | 2 | 0 | 3 | 3 | 2 | 0 | 14 | 10 |

1. Population Benefited
2. Percentage of Jurisdiction Benefited
3. Health and Safety Considerations
4. Implementation Costs
5. Cost Impact of the Initiative
6. Benefit to Cost Ratio
7. Probability of Acceptance
8. Probability of Funding
9. Feasibility of Implementing
10. Consistency with other Plans

**FLOODING**

| Measure | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total Pts | Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.1.1. | 0 | 0 | 1 | 1 | 3 | 1 | 3 | 3 | 3 | 1 | 16 | 4 |
| 2.1.2. | 0 | 0 | 1 | 1 | 3 | 0 | 3 | 3 | 3 | 2 | 16 | 4 |
| 2.1.3. | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 3 | 3 | 1 | 13 | 5 |
| 2.2.1. | 0 | 0 | 0 | 4 | 3 | 4 | 1 | 3 | 3 | 2 | 20 | 3 |
| 2.2.2. | 0 | 0 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 2 | 7 | 6 |
| 2.3.1. | 3 | 1 | 1 | 4 | 2 | 4 | 4 | 2 | 2 | 2 | 25 | 2 |
| 2.3.2. | 4 | 4 | 2 | 4 | 1 | 2 | 4 | 2 | 3 | 3 | 29 | 1 |

**WILDFIRES**

| Measure | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total Pts | Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.1.1. | 3 | 3 | 2 | 4 | 3 | 4 | 4 | 2 | 3 | 2 | 30 | 2 |
| 3.1.2. | 0 | 0 | 1 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 27 | 3 |
| 3.1.3. | 0 | 0 | 1 | 4 | 2 | 4 | 4 | 2 | 4 | 3 | 24 | 5 |
| 3.1.4. | 4 | 4 | 2 | 4 | 3 | 4 | 4 | 2 | 4 | 3 | 34 | 1 |
| 3.2.1. | 4 | 2 | 0 | 4 | 3 | 4 | 0 | 0 | 0 | 2 | 19 | 8 |
| 3.2.2. | 3 | 2 | 0 | 4 | 3 | 4 | 4 | 0 | 3 | 3 | 26 | 4 |
| 3.2.3. | 0 | 0 | 0 | 4 | 4 | 4 | 3 | 4 | 3 | 2 | 24 | 5 |
| 3.2.4. | 1 | 0 | 0 | 4 | 3 | 4 | 3 | 0 | 2 | 3 | 20 | 7 |
| 3.2.5. | 1 | 1 | 1 | 4 | 3 | 4 | 0 | 0 | 0 | 2 | 16 | 9 |
| 3.3.1. | 2 | 2 | 1 | 4 | 2 | 4 | 2 | 3 | 1 | 1 | 22 | 6 |
| 3.3.2. | 1 | 1 | 1 | 4 | 3 | 4 | 0 | 0 | 0 | 2 | 16 | 9 |

The Knox County Hazard Mitigation Planning Team rated the following mitigation measure projects (in priority order) as the top priorities for the following hazards:

SEVERE WINTER & SUMMER STORMS MITIGATION MEASURE PROJECTS

1. Update or develop the resources section in the municipal Emergency Operations Plan with heavy equipment that could be used for snow removal.

2. Provide generators at all critical facilities and utilities such as Fire/Police Stations, EMS garages, public works fuelling points, Water & Sewer treatment plants, schools, and shelters.

3. Encourage homeowners to have generators, non-electrical heating, or alternate energy sources, such as solar, wind or hydro power.

4. Develop a written municipal road snow and ice removal operations plan that includes a prioritization of roads to be cleared.

5. Train and equip a quick-response Road Debris Clearance Team from public works, fire department and/or volunteers.

6. Develop plans to handle surges in boat mooring requirements.

7. Develop procedures & provide training to locate and identify special health need populations.

8. Deice slippery roads during or soon after a winter storm event.

9. Educate the public on dangers of severe winter and summer storms. (See sample in Appendix B)

10. Educate home owners about winter and summer storm preparations.

11. Develop/update ordinance to require new public facilities to have a generator.

12. Develop mutual aid agreements with local ATV & Snowmobile organizations.

13. Encourage residents without utilities to report to emergency shelters.

14. Encourage home owners to keep primary & secondary egress routes cleared.

15. Encourage home owners to purchase insurance for severe storm damages.

16. Develop alternate-transportation means for emergency responders.

FLOODING MITIGATION MEASURE PROJECTS

1. Upgrade ditches, culverts and roadway drainage systems.

2. Perform and develop a Stormwater Analysis and Management Plan.

3. Encourage home owners to relocate, elevate or retrofit homes in flood zones.

4. Educate drivers on risks of crossing flooded roadways.

5. Develop a "Barricade Plan" to block flooded roads in order to prevent crossing by vehicle operators. Acquire necessary barricade equipment and supplies.

6. Educate the public on staying away from flooded river banks and potential dam failure areas. (See Appendix B for Brochure).

7. Implement municipal floodplain ordinances.

WILDLAND FIRE MITIGATION MEASURE PROJECTS

1. Educate the public of dangers of forest fires.

2. Develop warning and evacuation plans and systems for fast moving forest fires.

3. Train all firefighters in Wildland Fire Fighting Safety.

4. Educate home owners on tactics to protect their homes from wildfires.

5. Equip all fire departments with sufficient wildfire personal protection equipment.

6. Provide more authority and better training to the municipal Fire Wardens.

7. Encourage bulk slash reduction through good Forestry BMPs.

8. Encourage the construction of Fire Ponds by private land owners.

9. Introduce building codes requiring fire-retardant roofing and siding materials.

10. Encourage private land owners to cut back tree growth along access drives.

11. Maintain woods and logging roads for firefighting access.

## MULTI-JURISDICTIONAL MITIGATION STRATEGY
## IMPLEMENTATION AND ADMINISTRATION OF MITIGATION MEASURES

| Requirement §201.6(c)(3) (iv): | For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan. |
|---|---|

Knox County's Hazard Mitigation Plan encompasses 18 jurisdictions. Strategies for hazard mitigation within the County were identified to reduce overall damage in the County. Although these strategies are aimed at reducing overall damage in the County, each jurisdiction will be responsible for pursuing the actions that are relevant to that jurisdiction. The jurisdictions, along with the specific actions they will pursue, are listed as follows:

| Jurisdiction | Responsible Agency | Funds | Time Frame | Action (In Priority Order) |
|---|---|---|---|---|
| Appleton | AOEM | $2,400 | June 05 | 1. Provide generator at EOC/Fire Station |
| | Road Comm | $36,550 | Aug 05 | 2. Upgrade ditches, culverts & drainage |
| | AOEM | $0 | June 05 | 3. Educate public on dangers of severe storms |
| | AFD | $850 | May 05 | 4. Equip FD with wildfire protective equipment |
| Camden | FD | $3,000 | Dec 05 | 1. Train firefighters in Wildland Fire Safety |
| | FD | $2,500 | Sept 04 | 2. Install Dry Hydrants |
| | EMA | $100 | Dec 04 | 3. Educate public on dangers of wildfires |
| | EMA | $100 | Dec 04 | 4. Educate public on dangers of severe storms |
| | EMA | $200 | Dec 04 | 5. Educate homeowners on storm preparedness |
| | EMA | $0 | Feb 05 | 6. Identify special needs populations |
| Cushing | FD | $1000 | Jun 05 | 1. Train firefighters in Wildland Fire Safety |
| | FD | for all | Jun 06 | 2. Develop forest fire warning & evac plans |
| | FD | measure | Jun 06 | 3. Educate public on dangers of wildfires |
| | FD | s | Jun 06 | 4. Educate home owners on wildfire protection |
| Friendship | EMA/Rd Com | $0 | Aug 05 | 1. Educate public on dangers of severe storms |
| | EMA/Rd Com | $250 | Aug 05 | 2. Train & equip road debris clearance team |
| | FD | $0 | Aug 05 | 3. Encourage landowners to cut back growth |
| Hope | HOEM | $0 | Aug 04 | 1. Locate & identify special needs populations |
| | HVFD | $200 | Nov 04 | 2. Train & equip road debris clearance team |
| Isle Au Haut | FD | $0 | Dec 05 | 1. Train firefighters in Wildland Fire Safety |
| | FD | $0 | Dec 04 | 2. Fire Extinguishers for all homes & businesses |
| | Selectmen | $1,350 | Mar 05 | 3. Deice roads during & after winter storm |
| | Selectmen | $0 | Dec 04 | 4. Distribute mitigation pamphlets to residents |
| Matinicus Isle Plant. | Assessors | $0 | Summer 04 | 1. Educate public of dangers of forest fires |
| | Fire Warden | $0 | | 2. Educate home owners on wildfire protection |
| | Fire Warden | $0 | | 3. Encourage landowners to cut back growth |
| | Fire Warden | $0 | | 4. Train & equip road debris clearance team |
| North Haven | Road Comm | $1,700 | Dec 04 | 1. Upgrade ditches, culverts & drainage |
| | NH EMS | $0 | Dec 04 | 2. Locate & identify special needs populations |
| | NH FD | $0 | Dec04 | 3. Train firefighters in Wildland Fire Safety |
| Owls' Head | FD | $0 | Aug 04 | 1. Educate public on dangers of wildfires |
| | Road Comm | $0 | Aug 04 | 2. Educate public on dangers of severe storms |
| | FD | $0 | Jul 05 | 3. Train & equip road debris clearance team |

| Jurisdiction | Responsible Agency | Funds | Time Frame | Action |
|---|---|---|---|---|
| Rockland | RPW & RFD | $400 | Sept 04 | 1. Train & equip road debris clearance team |
| | RFD | $400 | Dec 04 | 2. Train firefighters in Wildland Fire Safety |
| | RFD | $200 | Dec 04 | 3. Educate home owners on wildfire protection |
| Rockport | Public Works | $8,000 | Sep 05 | 1. Upgrade ditches, culverts & drainage |
| St. George | Road Comm | $0 | Nov 04 | 1. Develop Road snow/ice removal ops plan |
| | Road Comm | $0 | Sep 05 | 2. Deice roads during & after winter storm |
| | Road Comm | $300 | Nov 04 | 3. Educate public on dangers of severe storms |
| | FD | $300 | Nov 04 | 4. Educate homeowners on storm preparedness |
| | FD | $0 | Nov 04 | 5. Train & equip a road debris clearance team |
| | FD | $300 | Nov 04 | 6. Educate public on dangers of wildfires |
| | FD | $800 | Nov 04 | 7. Train firefighters in Wildland Fire Safety |
| | FD | $5,000 | Nov 04 | 8. Equip FD with sufficient wildfire PPE |
| | FD | $300 | Nov 04 | 9. Encourage landowners to build fire ponds |
| | FD | $300 | Nov 04 | 10. Encourage landowners to cut tree growth |
| South Thomaston | EMA | $0 | Jul 05 | 1. Update Snow Removal resources in EOP |
| | FD | $50 | Jun 05 | 2. Educate home owners on wildfire protection |
| | FD | $450 | Sept 05 | 3. Train firefighters in Wildland Fire Safety |
| | EMA | $50 | July 05 | 4. Encourage landowners to cut tree growth |
| Thomaston | Public Works | $0 | Aug 05 | 1. Train & equip road debris clearance team |
| | Public Works | $2,200 | Dec 05 | 2. Deice roads during & after winter storm |
| | EMA | $0 | Aug 05 | 3. Educate public on dangers of severe storms |
| | FD | $6,000 | Aug 06 | 4. Equip all firefighters with wildfire PPE |
| | FD | $100 | Aug 07 | 5. Encourage private construction of Fire Ponds |
| Union | FD | $2,500 | Oct 04 | 1. Install dry hydrants |
| | FD | $1,000 | Dec 05 | 2. Train firefighters in Wildland Fire Safety |
| | FD | $4,000 | Dec 05 | 3. Equip FD with sufficient wildfire PPE |
| | Public Works | $5,000 | Dec 05 | 4. Upgrade ditches, culverts & drainage |
| Vinalhaven | VH OEM | $50 | June 05 | 1. Educate the public of dangers of forest fires |
| | VH FD | $0 | June 05 | 2. Train firefighters in Wildland Fire Safety |
| | VH OEM | $50 | June 05 | 3. Educate home owners on wildfire protection |
| | VH OEM | $50 | June 05 | 4. Encourage landowners to cut back growth |
| | VH OEM | $100 | June 05 | 5. Train & equip road debris clearance team |
| Warren | EMA | $0 | Dec 06 | 1. Educate public on dangers of severe storms |
| | EMA | $0 | Dec 06 | 2. Alternate transportation for 1st Responders |
| Washington | FD | $500 | Jun 06 | 1. Train & equip road debris clearance team |
| | FD | $0 | Jun 05 | 2. Encourage landowners to build fire ponds |
| | FD | $250 | Jun 05 | 3. Encourage landowners to cut tree growth |
| Knox County | Kx Co EMA | $152 | July 05 | 1. Educate public on dangers of severe storms |
| | Kx Co EMA | $152 | July 05 | 2. Educate residents on storm preparedness |
| | Kx Co EMA | $0 | July 05 | 3. Encourage homeowners without utilities to report to emergency shelters. |

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## VI. PLAN MAINTENANCE PROCEDURES

§201.6(c)(4) requires a formal plan maintenance process to take place to ensure that the Mitigation Plan remains an active and pertinent document. The plan maintenance process includes a schedule for monitoring and evaluating the plan at least every five years, and continued public participation throughout the plan maintenance process.

This section also includes an explanation of how the county and municipal governments intend to incorporate their mitigation strategies into any existing planning mechanisms they have, such as comprehensive or capital improvement plans, or zoning and building codes.

This section includes the following three subsections as follows:

Monitoring, Evaluating, and Updating the Plan

Implementation Through Existing Programs

Continued Public Involvement

## MONITORING, EVALUATING, AND UPDATING THE PLAN

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| **Requirement §201.6(c)(4)(i):** | **The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.** |

Knox County has developed a method to ensure that regular review and update of the Hazard Mitigation Plan occurs. The Knox County Emergency Management Agency has formed a Hazard Mitigation Plan Evaluation Team that consists of members from the County EMA office, the County Commissioners, Selectmen and EMA directors from member towns and the Local Emergency Planning Committee. The County EMA Office is responsible for contacting Team members and organizing the meeting every four years. The meeting will be held in March of the fourth year after the last plan revision was approved, and Team members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the plan.

The Team will review each mitigation goal and objective to determine their relevance to changing situations and land developments in the County, as well as changes in State or Federal policy, and to ensure that they are addressing current and expected conditions. The Team will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The parties responsible for the various implementation actions will report on the status of their projects and will include which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding, and which strategies should be revised.

The Knox County EMA Office will then have one year to update and make changes to the plan before submitting it to the State Hazard Mitigation Officer. If no changes are necessary, the State Hazard Mitigation Officer will be given a justification for this determination.

## IMPLEMENTATION THROUGH EXISTING PROGRAMS

| Requirement §201.6(c)(4) (ii): | The plan shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate. |
|---|---|

County government is very limited in scope and authority in the State of Maine and does not have the manpower, power, or fiscal capabilities to guide and control development within the towns in the County. Within Maine, most government authority is with State statures and rules and with municipal "Home Rule" ordinances.

Eleven of the 18 municipalities have less then 2,000 people and are not required to have a building inspector, according to State law.

There were very few ordinance-related mitigation measures identified by the Knox County Hazard Mitigation Planning Team and those identified were determined to be low in priority. Ordinances do not fair well in rural Maine communities, where residents want to be left alone and not dictated to by their local government. Therefore, the majority of the mitigation measures that were identified and all those that were selected by the individual towns are either structural, public educational, or emergency planning measures.

After adoption of the Mitigation Plan, the Knox County EMA Office will assist the municipal officers in implementing their selected mitigation measures. The County EMA Office will conduct annual reviews and surveys with the municipal officers and local EMA directors to determine the status of their measures. The County EMA office will assist the municipalities with the completion of FEMA Pre-Disaster Mitigation and Hazard Mitigation Grant packages.

The responsible agency within each municipality that is responsible for the implementation and completion of each mitigation measure will notify the County EMA Office whenever assistance is needed or whenever a measure is completed. Existing programs such as the municipal Road Maintenance Plan, Emergency Management program and local fire prevention programs will be utilized to their greatest extent to complete the community's mitigation measures.

## CONTINUED PUBLIC INVOLVEMENT

| Requirement §201.6(c)(4) (iii): | The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process. |
|---|---|

Knox County is dedicated to involving the public directly in the continual reshaping and updating of the Hazard Mitigation Plan. The Hazard Mitigation Plan Evaluation Team members are responsible for the review and update of the plan. Although they represent the public to some extent, the public will be able to directly comment on and provide feedback about the plan.

Copies of the plan will be issued to the municipal Emergency Management Directors and kept on hand at all municipal town offices in the County. The existence and location of these copies will be publicized by posting flyers in all the town offices. Contained in the plan is the address and phone number of the Knox County EMA Office, which is responsible for keeping track of public comments on the plan.

A public meeting will also be held after each Mitigation Plan Evaluation Team review meeting. This meeting will provide the public a forum for which they can express concerns, opinions, or ideas about the plan. The County EMA Office will publicize and host this meeting.

Knox County Emergency Management Agency
62 Union Street, Rockland, Maine 04841
Office Phone: (207) 594-5155
E-Mail: sebema@knoxcounty.midcoast.com

# KNOX COUNTY HAZARD MITIGATION PLAN

## APPENDIX A - PLANNING MEETING ATTENDANCE ROSTERS

Knox County Hazard Mitigation Planning Team meetings were held to collect data and make decisions regarding the hazards to be profiled and the mitigation measures to implement. Copies of the rosters are attached to this section.

# KNOX COUNTY EMERGENCY MANAGEMENT AGENCY
# CONTACT ROSTER

JAN 27, 2003

Type of Course/Meeting: **HAZARD MITIGATION PLAN**

Tom

| Town | Name (Please Print) | Office | Phone Number |
|---|---|---|---|
| APPLETON | Tay Vaughan | EMA Director | 785-5511 |
| CAMDEN | | | |
| CUSHING | ARTHUR T. KISKILA | EMA DIRECTOR | 354-2339 |
| FRIENDSHIP | | | |
| HOPE | Clarence Keller | EMA Director | 763-4118 |
| ISLE AU HAUT | | | |
| MATINICUS ISLE PL | | | |
| NORTH HAVEN | | | |
| OWL'S HEAD | | | |
| ROCKLAND | | | |
| ROCKPORT | | | |
| ST GEORGE | Timothy Polky | EMA Director | 372-6363 |
| SOUTH THOMASTON | BILL BROWN | EMA. DIRECTOR | 596-6020 |
| THOMASTON | PHILLIP NETZORG | EMA DIRECTOR | 354-0938 |
| UNION | PAUL DOUGHTY | EMA DIRECTOR | 785-2191 |
| VINALHAVEN | MARJORIE E. STRATTON | EMA DIRECTOR | 863-4471 |
| WARREN | GEORGE FIELD | EMA DIRECTOR | 273-2772 |
| WASHINGTON | Tom Johnston | EMA Dir | 845-2716 |

Knox County ANNE BEEBE-CENTER Commissioner 594-2060

# KNOX COUNTY EMERGENCY MANAGEMENT AGENCY
# SIGN-IN ROSTER

Type of Course/Meeting: **HAZARD MITIGATION PLAN PUBLIC MEETING**

Date/Time: **February 6, 2003, 7:00 pm** Facilitator: Dale Rowley

| | **Name** (Please Print) | **Position** | **Community** | **Contact Info** |
|---|---|---|---|---|
| 1 | Clarence Spady | Selectman | Union | POB 534 Union, 785 4931 |
| 2 | Tim Polky | Fire Chief | St. George | 372-6363 |
| 3 | Raymond Wooster | Fire Chief | Rockland | 594-0318 |
| 4 | Donald L. Grinnell | Selectman | Washington | 845-2377 |
| 5 | Anne Beebe-Center | Commissioner | Knox | 594-2060 |
| 6 | Donna Allen | EMA Clerk | Knox Cty | 594-5155 |
| 7 | Dake Collins | Administrator | North Haven | 867-4433 |
| 8 | Sylvia Birmingham | Director | Knox County | 594-5155 |
| 9 | Craig E. Cooley | Director | Rockport | 236-2026 |
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# KNOX COUNTY EMERGENCY MANAGEMENT AGENCY
# SIGN-IN ROSTER

Type of Course/Meeting: **HAZARD MITIGATION PLAN - RISK ASSESSMENT MEETING**

Date/Time: **February 25, 2003, 7:00 pm** Facilitator: Dale Rowley

| | **Name** (Please Print) | **Position** | **Community** | **Contact Info** |
|---|---|---|---|---|
| 1 | Kiskila, Arthur T | Director | Cushing | |
| 2 | Doughty, Paul V. | " | Union | |
| 3 | Kyle Martin | Director | Friendship | |
| 4 | Marjorie Stratton | Director | Vinalhaven | |
| 5 | Clarence Keller | Director | Hope | |
| 6 | Timothy Polky | Director | St. George | |
| 7 | Phillip Nelson | Director | Thomaston | |
| 8 | Tom Johnston | | Washington | |
| 9 | Bill Brown | Dir. | So. Thomaston | |
| 10 | Cooley, Craig E | Director | Rockport | |
| 11 | George Field | Director | Warren | |
| 12 | Sylvia E Birmingham | Director | Knox Co. | |
| 13 | Taylor Vaughan | Director | Appleton | |
| 14 | Donna Allen | EMA Clerk | Knox Cty | |
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# KNOX COUNTY EMERGENCY MANAGEMENT AGENCY
# SIGN-IN ROSTER

Type of Course/Meeting: **HAZARD MITIGATION MEETING - IDENTIFYING ASSETS**

Date/Time: **March 25, 2003, 7:00 pm** Facilitator: Dale Rowley

| | Name (Please Print) | Position | Community | Contact Info |
|---|---|---|---|---|
| 1 | PHILIP NETZORG | EMA DIRECTOR | THOMASTON | |
| 2 | BILL BROWN | EMA DIR | SO. THOMASTON | |
| 3 | Frank Ross | EMA Dir. | Owls Head | |
| 4 | Tim Polky | EMA Dir | St. George | |
| 5 | ARTHUR T. Kistlib | EMA Dir | Cushing | |
| 6 | Craig E. Conley | EMA Director | Rockport | |
| 7 | Kyle E. Martin | EMA Director | Friendship | |
| 8 | Clarence J. Keller | EMA Directo | Hope | |
| 9 | Marjorie Stratton | EMA Director | Vinalhaven | |
| 10 | Sylvia E. Burningham | Director | Knox Co EMA | |
| 11 | Donna Allen | EMA Clerk | Knox Co. EMA | |
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# KNOX COUNTY EMERGENCY MANAGEMENT AGENCY
# SIGN-IN ROSTER

Type of Course/Meeting: **HAZARD MITIGATION MEETING - Land Use/Future Development**

Date/Time: **April 22, 2003, 7:00 pm** Facilitator: Dale Rowley

| **Name** (Please Print) | **Position** | **Community** | **Contact Info** |
|---|---|---|---|
| 1 Kyle MARTIN | EMA DIR | Friendship | |
| 2 KISKILA, ARTHUR | EMA DIR | Cushing | |
| 3 BILL BROWN | EMA DIR. | SO. THOMASTON | |
| 4 PAUL DOUGHTY | EMA DIR | UNION | |
| 5 STEVE GIBBONS | EMA DIR. | CAMDEN | |
| 6 Sylvia Birmingham | EMA Dir | Knox County | |
| 7 Donna Allen | EMA Clerk | Knox County | |
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# KNOX COUNTY EMERGENCY MANAGEMENT AGENCY
# SIGN-IN ROSTER

Type of Course/Meeting: **HAZARD MITIGATION MEETING - Municipal Surveys**

Date/Time: **August 26, 2003, 7:00 pm** Facilitator: Dale Rowley

| | **Name** (Please Print) | **Position** | **Community** | **Contact Info** |
|---|---|---|---|---|
| 1 | LINWOOD LOTHROP | DIRECTOR | KNOX RCC | 594-0677 |
| 2 | Wendy Chaston | Selectman | Appleton | 785-4132 |
| 3 | [illegible] MARTIN | DIRECTOR | Friendship EMA | 832-6059 |
| 4 | PHILIP NETZORG | DIRECTOR | THOMASTON | 354-0938 |
| 5 | Mike Leo | Amb Director | Thomaston | 354-6345 |
| 6 | Bill Adams | Fire Chief | Thomaston | 354-6345 |
| 7 | Carrie Adams | Emergency Services Coor. | Thomaston | 354-6345 ext 238 |
| 8 | Ann Amarello | RSVP/CCAP | Rockland | 596-0361 |
| 9 | Mona T. Stearns | RSVP/CCAP | Rockland | 596-0361 |
| 10 | Adam Miceli | Asst. Fire Chief | Rockland | 594-0318 |
| 11 | STEVE GIBBONS | FIRE CHIEF | CAMDEN | 236-7950 |
| 12 | ARTHUR T. KISLIK | DIRECTOR/CHIEF | CUSHING | 354-2339 |
| 13 | ANDREW HART | TOWN MANAGER | UNION | 785-7650 |
| 14 | PAUL V. DOUGHTY | DIRECTOR | UNION | 785-2191 |
| 15 | Bruce Fitzgerald | Mitigation Planner | MEMA | 626-4503 |
| 16 | Michael Steinbuchel | WMD | MEMA | 626-4402 |
| 17 | Tom Johnston | EMA Dir | Washington | 845-2816 |
| 18 | Frank Ross | EMA Dir | Owls Head | 594-4076 |

19. Taylor Vaughan Appleton EMA Director 785-5511
20 George FIELD WARREN EMA DIR. 273-2772
21 Marjorie Stratton Vinalhaven EMA Dir 863-4471
22. Craig E. Cooley Rockport EMA Director 236-2026
23. Mark Peters Portland Press Herald 791-6325
24. Donna Allen Knox EMA

# KNOX COUNTY EMERGENCY MANAGEMENT AGENCY
# SIGN-IN ROSTER

Type of Course/Meeting: **HAZARD MITIGATION MEETING - Mitigation Goals**

Date/Time: ~~October~~ NOVEMBER 25 **, 2003, 7:00 pm** Facilitator: Dale Rowley

| | **Name** (Please Print) | **Position** | **Community** | **Contact Info** |
|---|---|---|---|---|
| 1 | GEORGE FIELD | EMA DIR. | WARREN | |
| 2 | Craig E. Cooley | EMA Dir | Rockport | |
| 3 | [illegible] | EMA Dir | Friendship | |
| 4 | ARTHUR T. KISILO | EMA | Cushing | |
| 5 | Sylvia E. Birmingham | EMA Director | Knox County | |
| 6 | Eunice Mommens | Red Cross - Disaster Chair | Eastern Maine Chapter | |
| 7 | HARRY Pretzel | WRFR-LP | Rockland | |
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# KNOX COUNTY EMERGENCY MANAGEMENT AGENCY
# SIGN-IN ROSTER

Type of Course/Meeting: **HAZARD MITIGATION MEETING - Mitigation Strategy**

Date/Time: 27 JAN 04 7pm Facilitator: Dale Rowley

| | Name (Please Print) | Position | Community | Contact Info |
|---|---|---|---|---|
| 1 | Kiskila, Arthur F | EMA Dirctr | Quching | 354-2339 |
| 2 | Kyle Martin | EMA Director | Friendship | 832-6059 |
| 3 | George Field | EMA Director | Warren | 273-2772 |
| 4 | Bill Brown | EMA Director | So. Thomaston | 596-6020 |
| 5 | Phillip Netzorg | EMA Director | Thomaston | 354-0938 |
| 6 | Paul Doughty | EMA Dir | Union | 785-2191 |
| 7 | Craig E. Cooley | EMA Dir | Rockport | 236-2026 |
| 8 | Donna Allen | EMA Clerk | Knox Cty EMA | 594-5155 |
| 9 | Sylvia Birmingham | EMA Dir | Knox Co. | |
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# KNOX COUNTY EMERGENCY MANAGEMENT AGENCY
# SIGN-IN ROSTER

Type of Course/Meeting: **HAZARD MITIGATION PLANNING MEETING**

Date/Time: February 24, 2004 7 pm  Facilitator: Dale Rowley

| | **Name** (Please Print) | **Position** | **Community** | **Contact Info** |
|---|---|---|---|---|
| 1 | Tom Johnston | EMA Dir | Washington | tomsmapt@pivot.net |
| 2 | Paul Daughty | EMA Dir | Union | |
| 3 | Clarence Keller | EMA Dir | Hope | |
| 4 | George Field | EMA Dir | Warren | |
| 5 | Craig E Cooley | EMA Director | Rockport | |
| 6 | Tim Polky | EMA Director | St. George | |
| 7 | Steve Gibbons | EMA Director | Camden | |
| 8 | Phillip Netzorg | EMA Director | Thomaston | |
| 9 | Marc Candage | EMA Director | Vinalhaven | |
| 10 | Arthur T Kiskila | EMA Director | Cushing | |
| 11 | Donna Allen | EMA Clerk | Knox County | |
| 12 | Sylvia Birmingham | EMA Director | Knox County | |
| 13 | Scott J Ewen | EMA Director | Knox County | |
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# KNOX COUNTY EMERGENCY MANAGEMENT AGENCY
# SIGN-IN ROSTER

Type of Course/Meeting: **HAZARD MITIGATION PLANNING MEETING**

Date/Time: March 23, 2004 at 7 pm  Facilitator: Dale Rowley

| | **Name** (Please Print) | **Position** | **Community** | **Contact Info** |
|---|---|---|---|---|
| 1 | Miskila, Arthur F | Director | Cushing | |
| 2 | Cooley, Craig E | Director | Rockport | |
| 3 | Doughty Paul V. | Director | Union | |
| 4 | Phillip Notzorg | Director | Thomaston | |
| 5 | Martin Kule | Director | Friendship | |
| 6 | George Field | Director | Warren | |
| 7 | Scott J Ewen | Director | Cushing | |
| 8 | Donna Allen | Clerk | Knox Cty EMA | |
| 9 | Sylvia E. Birmingham | Director | Knox Cty EMA | |
| 10 | Bill Brown | D/A | So. Thomaston | |
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# KNOX COUNTY EMERGENCY MANAGEMENT AGENCY
# SIGN-IN ROSTER

Type of Course/Meeting: **HAZARD MITIGATION PLANNING MEETING**

Date/Time: May 25, 2004 at 7 pm  Facilitator: Dale Rowley

| | **Name** (Please Print) | **Position** | **Community** | **Contact Info** |
|---|---|---|---|---|
| 1 | Kiskila, Arthur | Director | Cushing | chiefkiskila1@aol.com |
| 2 | Marc O. Candage | Director | Vinalhaven | firedept@foxisland.net |
| 3 | Alton Hadley | Town Administrator | North Haven | ahadley@midcoast.com |
| 4 | BILL BROWN | EMA DIR. | SO. THOMASTON | |
| 5 | Tom Johnston | EMA Dir | Washington | Tomsmail@pivot.net |
| 6 | Frank Ross | EMA Dir. | Owls Head | |
| 7 | EVA MURRAY | EMA Director | MATINICUS ISLAND | |
| 8 | Tom Molloy | City Councilor | city of Rockland | TJM@midcoast.com |
| 9 | Cooley, Craig E | Director | Rockport | raven@midcoast.com |
| 10 | Donna Allen | Clerk | Knox Cty | |
| 11 | Sylvia Birmingham | Knox Co EMA Director | Knox Cty. | |
| 12 | PHILLIP NETZORG | DIRECTOR | THOMASTON | |
| 13 | CHARLES D. JORDAN, JR | FIRE CHIEF DIRECTOR | ROCKLAND | cjordan@ci.rockland.me.us |
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# KNOX COUNTY HAZARD MITIGATION PLAN

**APPENDIX B**

**DAM ACTION PLAN BROCHURE**

**SEVERE WINTER/SUMMER STORMS PAMPHLET**

The Knox County Emergency Management Agency has included the above example mitigation measures for public information in this section.

# KNOX COUNTY HAZARD MITIGATION PLAN

## APPENDIX C – DAM MAPS

The Knox County Emergency Management Agency has attached Dam Maps to this section.